

.. 8, NO. 56

MAY 195

THE POLAR RECORD



A Journal of Arctic and Antarctic Exploration and Research
Issued by the Scott Polar Research Institute, Cambridge



SIR RAYMOND PRIESTLEY

THE POLAR RECORD

Editor: L. M. Forbes. Editorial Committee: B. B. Roberts, J. A. Steers,
J. M. Wordie

Vol. 8 May, 1957 No. 56

CONTENTS

FRONTISPIECE Sir Raymond Priestley

FOREWORD page 411

ARTICLES:

The new constitution of the Scott Polar Research Institute . . . 412
Instituto Antártico Argentino. By Rodolfo N. Panzarini . . . 419
Insurance against ice risks at sea. By Terence Armstrong . . . 421
The breeding and maintenance of sledge dogs. By R. J. F. Taylor . 429
The "prairie ice jigger". By W. M. Sprules 441

FIELD WORK:

International Geophysical Year, 1957-58: Arctic, 1957 . . . 445
Danish glaciological work in Greenland, 1956 447
French expedition to central Greenland, 1956-57 447
Oxford University Expedition to west Greenland, 1956 448

NOTES:

Changes in Greenland constitution, 1947-55 449
Norwegian Arctic weather stations in 1956 451
Arktisk Institut, Denmark 453
The Northern Sea Route in 1956 453
A new university in Yakutsk 455
Eighth meeting of the International Whaling Commission, 1956 . 455
Recovery of *Jopeter* in the Greenland Sea, 1956 456
The *Eskimo Bulletin* 456
Visit of the Duke of Edinburgh to the Falkland Islands Dependencies
and Gough Island, 1957 457
British official approval of place-names in the Falkland Islands
Dependencies 458
United States Gazetteer: *Geographic names of Antarctica*. . . . 460
Renewal of tripartite Antarctic naval declarations for the season
1956-57 461
Chilean laws relating to the Antarctic, 1955 and 1956 461

OBITUARY	page 465
RECENT POLAR LITERATURE	468
ERRATA	491
Thirtieth Annual Report of the Committee of Management of the Scott Polar Research Institute	492

FOREWORD

The frontispiece of this issue is a photograph of Sir Raymond Priestley, acting Director of the Falkland Islands Dependencies Scientific Bureau. Sir Raymond was geologist of Shackleton's British Antarctic Expedition, 1907-09, and of Scott's British Antarctic (*Terra Nova*) Expedition, 1910-13. He was Secretary-General of the Faculties, Cambridge University, 1934; Vice-Chancellor of the University of Melbourne, 1935-38; and Principal and Vice-Chancellor of the University of Birmingham, 1938-52. He was President of the British Association in 1956. He accompanied the Duke of Edinburgh during his visit to the Falkland Islands Dependencies and Gough Island in January 1957.

Commander J. H. Mather resigned the office of Honorary Secretary of the Antarctic Club in September 1956. He founded the club in 1929 and had been secretary ever since. He is succeeded by Mr A. Stephenson, who was surveyor of the British Graham Land Expedition, 1934-37. We greatly regret to record the death of Commander Mather on 10 April 1957; an obituary will appear in the next issue of the *Polar Record*.

April 1957

THE NEW CONSTITUTION OF THE SCOTT POLAR RESEARCH INSTITUTE

In the last issue of the *Polar Record* an impending readjustment of the constitution of the Scott Polar Research Institute was announced. This was formally approved by the University on 23 February 1957, and comes into force as from 1 January 1957. The following is the full text of the report of the General Board of the University:¹

28 November 1956

The GENERAL BOARD beg leave to report to the University as follows:

1. The principle of the establishment of a Scott Polar Research Institute and the provision of temporary accommodation for it in the Sedgwick Museum of Geology were approved by Grace 4 of 26 November 1920 on recommendations contained in a Report, dated 11 November 1920, of the Council of the Senate on the proposed establishment and endowment of an institute for polar research as a memorial to Captain Scott. The essential features of the institute which the Council recommended for establishment were stated in the preamble of the Council's Report as including:

1. A comprehensive collection of all polar literature into a library.
2. A museum of polar equipment.
3. A collection of duplicates of type specimens of new genera and species both biological and zoological.
4. A set of rooms available for research work.

2. By Grace 1 of 9 May 1925 the University accepted from the Trustees of the Captain Scott Memorial Fund the sum of £13,000 for the erection, endowment, and maintenance of a Scott Polar Research Institute. The present building of the Institute was erected in 1934; it comprises a museum and two office rooms on the ground floor; a library and two office rooms on the first floor, and a gallery of attic rooms which are used for additional library, storage, and office purposes. By Grace 3 of 11 December 1925 the University approved regulations for a Committee of Management of the Scott Polar Research Institute in a form which is essentially the same as the regulations now current (*Ordinances*, 1955, p. 640). These regulations define the composition of the Committee of Management and charge it with the general management of the Institute, and with reporting annually to the University on its work. The regulations also empower the Committee to appoint a Director at a salary to be approved by the Financial Board, but they make no provision for other staff.

3. The position of the Institute in relation to the University has never been precisely defined. The regulations for the Institute are included in Chapter VIII of the Ordinances of the University but the Committee of Management have not in the past submitted annual statements of needs or annual estimates to the Council of the Senate in accordance with Regulations 2 and 4 for University funds (*Ordinances*, p. 591). The needs of the Institute have accordingly never been considered in connexion with the possibility of its receiving a grant from the Chest.

4. The Endowment and Maintenance Funds of the Institute produce a total annual income of about £550 and in its early years the Institute had little other income. The Director, who was the Professor of Geography, received as Director no stipend other than a small pensionable payment for administration, and the typical

¹ Reprinted from the *Cambridge University Reporter*, Vol. 87, No. 15, 12 December, 1956, p. 430-36.

annual expenditure of the Institute was made up of about £100 for administration, about £350 for departmental maintenance and about £150 for maintenance of premises. In the period from its establishment to the beginning of the second world war the Institute fulfilled fairly closely the functions forecast for it in the Council's Report of 1 November 1920 with the exception of the collection of sets of duplicates of type specimens of new genera and species. During this period the work of the Institute was largely performed by voluntary helpers.

5. During the second world war the Institute continued publication of its journal the *Polar Record*, but the main part of its building was occupied by a service department. The rent received for the building accumulated as a reserve fund which was of assistance in beginning the post-war activities of the Institute. During the war, the Institute's library and information files, and the experience of those who had worked with them, were of value to a number of government departments over a wide field of topics associated with polar conditions.

6. After the end of the war the work of the Institute expanded rapidly and, with the approval of the Council of the Senate, the Committee of Management approached H.M. Treasury for a direct grant-in-aid in order to maintain and increase the facilities which the Institute began to offer to government departments as a source of information on polar regions, indeed as the principal source of such information not only in the Commonwealth but elsewhere. The first such Treasury grant-in-aid was received in the University financial year 1946-47 and amounted to £1800. In the University financial year 1955-56 the amount received was £5666. 13s. 4d., being part of a year's payment at the rate of £5250 and part at the rate of £6500.

7. By the end of 1955, the graduate staff of the Institute numbered eight, of whom the Director and one other were employed for part-time work, and the assistant staff numbered three. The assistant staff have for many years had the status of University assistants, but the position of the graduate staff other than the Director has been undefined and they have been employed on an annual basis not holding any established University offices or posts.

8. The expenditure of the Institute in the University financial year 1955-56 may be summarized as follows:

	£	£
Administration:		
Stipends	1419	
Wages	687	
Printing	806	
		2912
Departmental Maintenance:		
Stipends	6043	
Printing	519	
Library (excluding stipends).	348	
Travelling, carriage, and sundries.	982	
		7892
Maintenance of premises:		
Rates	158	
Insurance	15	
Heat, light, and water	206	
Repairs and cleaning	333	
		712
Officers' Pension Fund	610	
Capital expenditure met from income	472	
		<hr/> £12598

The Institute's income in the same year may be summarized as follows:

	£
Endowment and Maintenance Fund	557
Treasury grant-in-aid	5667
Commonwealth grants and contracts	2749
Donations	103
Sales, and refunds of expenses	100
Payments for services rendered	180
	<hr/>
	£9356

There was, therefore, a deficit of £3242 on the year's working and the General Board understand that the Committee of Management appreciated in advance that a deficit of this nature would be incurred when in 1955 they raised the stipends of members of the staff of the Institute in conformity with the increases of University stipends which took effect from 1 October 1954. The Board understand also that although the Treasury were aware of the Committee's intention to raise the stipends of their staff, the question of an appropriate change in the Treasury grant-in-aid was deferred pending the outcome of the negotiations, referred to below, about the future of the Institute.

9. In July 1954, the University Grants Committee enquired whether the University would provide for the future maintenance of the Institute from general University funds, on the assumption that the direct Treasury grant-in-aid would be brought to an end and that for the remaining years of the current quinquennium (1952-57) the block grant to the University would be increased by an appropriate amount (to be agreed between the Treasury, the University Grants Committee, and the University). The University Grants Committee made it clear that they would neither wish nor be prepared to provide an ear-marked grant for the Institute and that, if the University agreed to their proposal to assume financial responsibility for it, then it would be for the University to decide from year to year, and from quinquennium to quinquennium, the extent to which the work of the Institute should be developed or limited.

10. The Council of the Senate consulted both the Committee of Management of the Institute and also the General Board on this question, and in November 1955 the Committee of Management submitted to the General Board a long and detailed report which described the foundation, constitution, history, finance, staffing, and buildings of the Institute, its present activities, and its future needs. The report ended by recommending that Treasury funds for the support of the Institute should in future be received through the University Grants Committee; that the University should allow for the expansion of the Institute in the quinquennium 1957-62 to the extent set out in their memorandum and described below; and that new regulations should be prepared in consultation with the Committee of Management for incorporation in Ordinances in a form which would provide for the Institute to become an institution under the supervision of the General Board. The programme of expansion proposed by the Committee of Management envisaged that by the end of the quinquennium 1957-62 the graduate staff of the Institute should be fourteen in place of the present eight, of whom two are part-time, and that a new wing should be added to the existing building of the Institute so as to double its present size. It also envisaged that the Directorship should in future be a full-time appointment and that all the graduate staff should hold established University offices or posts.

11. These proposals seemed to the General Board to involve a number of questions of principle and they accordingly appointed a Committee with wide terms of

reference to investigate the Institute's work and needs. The Committee visited the Institute and interviewed members of its staff and members of the University who had played an active part in the establishment of the Institute. They received oral and written evidence on the functions of the Institute and its needs for staff, buildings, and finance; on the extent to which its work is or could in the future be closely connected with the teaching and research of any of the scientific Departments of the University; on the extent to which its finance might reasonably be derived from the University or from outside sources; and on the practicability of separating those activities which more obviously belong to a University from those which might perhaps equally well be performed by a national research institute.

12. If the interests of the University were to be the sole criterion, the General Board think that the library and museum of an Institute such as was originally envisaged could satisfactorily function with a much smaller staff than that of the present Institute and that the government departments at present sponsoring the greater scale of activity might then be expected to establish a national institute to take over that side of the Institute's present activities. The Board have, however, been convinced by the Committee of Management that the unique reputation of the Institute and the service which it can and does supply to the Commonwealth are such that it would be unreasonable, at this stage of the Institute's development, to try to confine its activities to the mould set by the Report of 1920 and thereby to force either the abandonment within the Commonwealth of the information service which the Institute now provides or the inevitable inconvenience and dislocation which would be involved by attempting to build up such facilities elsewhere. After further discussion between representatives of the General Board and the Committee of Management, the General Board have therefore agreed, subject to an assurance from the University Grants Committee that the necessary additional funds will be provided in the form of an addition to the present block grant, to propose to the University the establishment of four University teaching offices in the Scott Polar Research Institute and, in conformity with the principles described in the Board's two recent Reports on University development, the closer integration of the Institute into the main stream of University teaching and research by its constitution as a Sub-department within the Department of Geography.

13. As at present advised, the General Board would not be prepared to recommend to the University during the quinquennium 1957-62 the establishment of University offices or posts within the Scott Polar Research Institute in addition to the four referred to in paragraph 12, above. The Committee of Management have, however, represented to the Board that the service at present offered by the Institute to the United Kingdom and Commonwealth governments would suffer if the graduate staff of the Institute had to be reduced below its present effective level of seven. The General Board have therefore agreed that in accordance with their general policy for the acceptance of grants or contracts from outside bodies they would be prepared to approve the acceptance of grants or contracts for the support of not more than three full-time graduate research workers or the equivalent number of part-time workers. The General Board appreciate the obligation which the Institute has, as an established centre of polar research and information in the national and international field, and they hope that the more stable constitution now proposed for the Institute will enable the Institute to meet those obligations while at the same time bringing it fully within the main stream of University teaching and research.

14. The General Board's proposal that the Institute be constituted as a Sub-department in the Department of Geography rather than as a Department in the Faculty of Geography and Geology is a reflection of the Board's desire to secure the closest possible integration of the work of the Institute with that of the University. They think that this object is much more likely to be achieved if the Director and staff

of the Institute have direct responsibility to the Head of a University Department which undertakes a programme of teaching for a Tripos than if the Institute were an independent Department whose teaching officers might have some difficulty in securing a place in the teaching programme of the Faculty. The General Board see no reason why the constitution of the Institute as a Sub-department in the Department of Geography need in any way affect its present name and they have accordingly proposed in Recommendation II that the name of the Sub-department shall be the *Scott Polar Research Institute*.

15. In order to ensure that there shall still be the closest co-operation with outside bodies interested in the work of the Institute the General Board propose that in replacement of the present Committee of Management there be established an advisory committee to be known as the Committee for the Scott Polar Research Institute. The detailed duty of management of the Institute will in future fall on the Director who will be responsible to the Professor of Geography and to the Faculty Board of Geography and Geology but the new advisory committee, on which the General Board propose that both the Professor of Geography and the Director of the Institute shall be *ex officio* members, will continue to bring to the Director the advice and interest of other bodies concerned with polar research and, by being relieved of routine questions of administration, will be free to devote its attention to advising the Director on questions of polar research.

16. The general regulations for University teaching officers (*Ordinances*, p. 400) provide that all appointments to University teaching offices shall be made by the Appointments Committee responsible for the appointment of University Lecturers in the Faculty or Department concerned, except so far as may be provided by Statute or by the Ordinances relating to the particular office concerned, and except also that the General Board may if they think fit appoint not more than two additional persons to serve with the Appointments Committee for any particular occasion. The General Board think that the Directorship of the Institute is clearly an office for which specific provision should be made in Ordinances for special membership of the appointing committee, and Regulation 8 of the regulations proposed in the Schedule to this Report is drafted accordingly. The other offices which the Board propose for establishment are two Assistant Directorships of Research and a Senior Assistantship in Research. If the University approve the recommendations contained in this Report, the Board propose under Regulation 1 (c) of the general regulations for University teaching officers to add the Chairman of the Committee for the Scott Polar Research Institute and the Director of the Institute, if not already members of the Appointments Committee, to the Appointments Committee of the Faculty of Geography and Geology for consideration of appointments to these three offices.

17. Since the scope of the Institute's interests extends beyond the field of geography the General Board have considered whether the Director might with advantage be given responsibility to Heads of Departments other than Geography. After consultation with the Committee of Management they have agreed not to propose such an arrangement but instead to propose that the Director should be a member *ex-officio* of the Faculty Boards of Geography and Geology and of Biology "A". They have consulted the Faculty Boards concerned and have been assured that they offer no objection.

18. The General Board have been assured by the Committee of Management that they concur in the general policy described in the preamble and recommendations of this Report and that they approve the regulations contained in the Schedule hereto.

19. Throughout the negotiations leading up to this Report the General Board have kept the Council of the Senate in touch with the progress of the negotiations. The Council have informed the General Board of their approval of the arrangements that are now recommended by the Board to the University and of their intention, in

promoting a Grace for the approval of the recommendations contained in this Report, to promote at the same time a Grace for the rescission of the existing regulations for the Scott Polar Research Institute (*Ordinances*, p. 640).

20. The General Board have been informed that Dr G. C. L. Bertram, for seven years the part-time Director of the Institute, has tendered his resignation from 31 December 1956 on appointment to a visiting Professorship in New Zealand and that the Committee of Management, with the concurrence of the Council of the Senate, have appointed Professor Steers, Professor of Geography, to act as Director of the Institute until a Director can be appointed in accordance with the new constitution now proposed for the Institute.

Recommendations

The General Board recommend:

I. That, with effect from 1 January 1957, the Scott Polar Research Institute be constituted as a Sub-department within the Department of Geography.

II. That the regulations for the Scott Polar Research Institute set out in the Schedule to this Report be approved and be inserted in Ordinances immediately after the regulations for Sub-departments (*Ordinances*, p. 385).

III. That the regulations for Sub-departments (*Ordinances*, p. 385) be amended as follows:

Regulation 2.

By inserting below the Sub-department of Aeronautics:

Geography	Scott Polar Research Institute	The Director of the Scott Polar Research Institute
-----------	-----------------------------------	---

IV. That, subject to the Financial Board's being satisfied that the necessary funds have been made available and having so notified the University, there be established in the Department of Geography from 1 January 1957 the following University teaching offices:

- 1 Directorship of the Scott Polar Research Institute.
- 2 Assistant Directorships of Research (Polar Research).
- 1 Senior Assistantship in Research (Polar Research).

V. That the Director of the Scott Polar Research Institute be added as a member in class (f) of the Faculty Boards of Geography and Geology, and of Biology "A".

VI. That, notwithstanding the proposed Regulation 11 for the Scott Polar Research Institute, the first members of the Committee for the Institute be appointed forthwith to serve for such periods not exceeding four years as may be determined by the Council of the Senate.

BRIAN W. DOWNS, <i>Vice-Chancellor</i>	C. F. A. PANTIN	F. B. KIPPING
H. THIRKILL	C. E. TILLEY	L. J. POTTS
J. BURNABY	E. E. RICH	T. C. THOMAS
W. V. D. HODGE	N. F. MOTT	M. H. GLEESON-WHITE

The Financial Board offer no objection to the recommendations contained in this Report.

BRIAN W. DOWNS, *Vice-Chancellor*

5 December 1956

SCHEDULE

SCOTT POLAR RESEARCH INSTITUTE

1. The Scott Polar Research Institute shall be a Sub-department within the Department of Geography.

2. The office of Director of the Scott Polar Research Institute shall be a University teaching office.

3. The duties of the Director of the Scott Polar Research Institute shall be to advance knowledge in his subject, to promote and direct research in it, and to supervise the work of the Institute under the general direction of the Head of the Department of Geography.

4. The Director shall conform to such conditions of residence as may be determined by the General Board after consultation with the Committee for the Scott Polar Research Institute.

5. The Director shall not be Tutor, Assistant Tutor, Bursar, or Assistant Bursar of a College and shall not, without the consent of the General Board, give instruction on behalf of a College.

6. The stipend of the Director shall be determined by the General Board, with the approval of the Financial Board, after consultation with the Faculty Board of Geography and Geology. The stipend shall be subject to a deduction of specified amounts if the Director is or becomes a Fellow with dividend or the holder of a substantial College administrative office.

7. The Director, unless the General Board determine at or before his appointment that his office be tenable for a term of years, shall be entitled to hold office so long as he satisfactorily performs the duties of the office until the retiring age.

8. Appointments to the office of Director shall be made by the Appointments Committee of the Faculty of Geography and Geology in accordance with the provisions contained in Statute D, XVII, 3, for the appointment of a University Lecturer; provided that for this purpose the Chairman of the Committee for the Scott Polar Research Institute and one other person appointed by that Committee shall be members of the Appointments Committee.

9. There shall be a Committee for the Scott Polar Research Institute whose duty it shall be to advise the Director as to the most advantageous lines of education and research, and to promote co-operation with other bodies concerned with polar research.

10. The Committee shall consist of the Professor of Geography, the Director of the Scott Polar Research Institute, the Hydrographer of the Royal Navy, two members appointed by the General Board, two members appointed by the Faculty Board of Geography and Geology, one member appointed by the Faculty Board of Biology "A", one member appointed by the Faculty Board of Biology "B", one member appointed by the National Institute of Oceanography, one member appointed by the Royal Society, and one member appointed by the Royal Geographical Society.

11. Members of the Committee, except *ex-officio* members, shall be appointed in the Michaelmas Term to serve for four years from 1 January following their appointment.

12. The Committee shall elect annually one of its members as Chairman and a Secretary.

INSTITUTO ANTÁRTICO ARGENTINO

BY RODOLFO N. PANZARINI¹

[*MS. received 30 October 1956.*]

The Instituto Antártico Argentino was created in 1951 and began its activities by establishing a permanent base in Marguerite Bay, which was named "Base General San Martín". In January 1955 it built a second base, called "Base General Belgrano", on the Filchner Ice Shelf (lat. 77° 58' S., long. 38° 50' W.). Since the southern summer of 1952-53 the Institute has regularly sent a party of about twenty-five scientists to carry out field work with the annual Argentine navy Antarctic expedition. On 26 January 1956 the Institute was transferred to the Ministerio de Marina as an autonomous scientific and technical organization, not a component of the navy, and with the object of studying the nature of the Antarctic. Shortly after, it established itself in an old residential building owned by the government, at calle Cerrito 1248, Buenos Aires.

The Institute has been organized into a Secretariat comprising an Executive Office, a Publications Office, a Technical Filing Department, a Library, a Scientific Department with a geophysics division, a geology division, a biology division, a Museum, a Technical Department with an instruments and equipment division, a logistics division and a workshop, and a Business Office. The administration and operation of the Institute are the responsibility of a Director, a Secretary-General and two Department Chiefs, under whom is a scientific and technical staff of three geophysicists, one glaciologist, two geologists, four biologists, one chemist, three laboratory assistants, one museum curator, one museum assistant, one librarian, one cartographer, one taxidermist and one photographer. The expenses are provided for by some 5,200,000 Argentine pesos included in the yearly national budget, of which about 2,200,000 are to cover salaries and allowances, 200,000 to subsidize expeditions and field work in the Antarctic, 700,000 for instruments, equipment and books, and 850,000 for other administrative expenses.

At present there are being installed and equipped two chemical laboratories, two geological laboratories, a biological laboratory, a small cold room for biological specimens, a taxidermy and museum workshop, a photographic dark room, a drawing office, a library and lecture room, several offices and an instrument and equipment store.

The Institute has recently received a consignment of laboratory and field instruments from the United States worth 40,000 U.S. dollars, and has also acquired laboratory equipment and instruments worth about 200,000 Argentine pesos. It owns one "Beaver" and one "Cessna 180" aircraft and five motor vehicles for Antarctic travel.

¹ Director of the Institute.

The results of the research carried out are to be published in four series called *Publicaciones del Instituto Antártico Argentino*, *Contribuciones del Instituto Antártico Argentino*, *Recopilación de las Contribuciones del Instituto Antártico Argentino* and *Boletín del Instituto Antártico Argentino*. The first series is for long works, the second for short papers or articles, the third is to contain reprints bound into volumes, and the *Boletín* is to appear twice a year as a periodical of general information about the Antarctic, Antarctic activities and the progress of the Institute's work.

The Institute is to plan scientific observations to be made at the permanent Argentine Antarctic bases, and to organize short instructional courses to train men to make those observations and to collect and preserve specimens. It organizes lectures to promote knowledge of the Antarctic regions amongst the general public, and seminars on Antarctic problems and research for a specialized public with scientific training. Plans are also progressing for the participation of the Institute in the Antarctic activities of the International Geophysical Year, 1957-58. Two of its staff took part in the glaciology study course in Greenland organized in August 1956 by the United States Snow, Ice and Permafrost Research Establishment.

Members of the staff of the Institute are:

	Rear-Admiral R. N. Panzarini, Director
	A. J. Oddera, Secretary General
	O. Schneider, Chief of Scientific Department
	J. C. Piacenza, Chief of Technical Department
	H. Cibeira, Chief of Business Office
Biologists,	A. Corte (botany and bacteriology)
	R. A. Mauri (invertebrates)
	R. Novatti (vertebrates)
Chemist,	A. M. Boedo
Geologists,	R. Dalinger (in charge of glaciological investigations at "Base General San Martín" during International Geophysical Year)
	J. Di Lena (in charge of glaciological investigations at "Base Esperanza" during International Geophysical Year; temporary appointment)
	N. Fourcade (petrology)
	O. C. Schauer
Geophysicist,	E. Levin
Glaciologist,	C. A. Lisignoli (in charge of glaciological investigations at "Base General Belgrano" during International Geophysical Year)
Librarian,	L. C. Pessacq
Meteorologist,	J. Scholten
Museum curator,	S. M. Comerci
Physiologist,	J. C. Cabos

The Instituto Antártico Argentino is thus organized and operated to take its place as a research establishment in Antarctic scientific matters and polar technical problems.

INSURANCE AGAINST ICE RISKS AT SEA

BY TERENCE ARMSTRONG

[MS. received 11 May 1956.]

Normal insurance of hulls is not valid when vessels sail into certain waters where additional risks are incurred. These areas are exactly defined in a document produced by the Institute of London Underwriters known as the *Institute Warranties*, reproduced as Appendix 1. If a ship is required to sail in any of these waters, for instance Hudson Bay, or the Baltic Sea in winter time, suspension of the Warranty must be obtained from the underwriters by payment of additional premium to cover the additional risks involved. The nature of these risks is not specified, but clearly ice is a principal one in these two areas, and in some of the other areas.

The amount of the additional premium was determined at first by negotiation between ship-owners and underwriters concerned, but as the volume of traffic increased the rate was centrally co-ordinated by the underwriters' Joint Hull Committee. This method contrasts with the procedure for fixing the basal premium, which is the result of competition. In reaching their decision, the Joint Hull Committee take into account the present state of knowledge of the risks involved, and the rates may be adjusted as knowledge is increased.

A good example of this process in action is provided by the Hudson Bay Route. This route, from Europe to Churchill on Hudson Bay, was officially "opened" in 1931, and Table 1 shows how the increase in knowledge caused additional premiums to be reduced and the permitted period of navigation to be lengthened.

The development of the Hudson Bay Route became the concern of the Imperial (now Commonwealth) Shipping Committee, because of the route's importance in inter-Imperial trade. This Committee has issued a series of *Reports on Hudson Bay Marine Insurance Rates*, and study of these makes it possible to observe the effect of the various factors on the rates of premium for each year.

In general, favourable reports on the behaviour of the ice, improvements in charting and in navigational aids (especially shore radio stations), and the availability of a Canadian Government patrol ship, resulted in a steady reduction of rates. The publication of sailing directions in 1932, for instance, was the main factor causing the drop in rates that year; on the other hand, when the *Bright Star* struck an iceberg in Hudson Strait the same season and sank, this undoubtedly prevented any reduction in the next season. A factor of a different sort, however, was always of primary importance; this was the number of ships using the route the previous season. If the number was small, the underwriters generally refused to make any reduction in premium, no matter how favourable the other factors, because the spread of underwriting risks was too limited.

Table 1. *Insurance of hulls on Hudson Bay Route, 1931-55*(From *Reports on Hudson Bay Marine Insurance Rates*, London, Stationery Office, 1930-55.)

Season	Minimum additional premiums (hulls insured "W.A. and F.P.A. unless")			Period of navigation permitted by underwriters		
	Per ton G.R.T.	Percentage on insured value		Opening (entering Hudson Strait)	Closing (leaving Churchill)	
		With gyro	Without gyro			
						s. d.
1931	2 0	50 0	50 0	10 Aug.	30 Sept.	
1932	2 0	40 0	50 0	10 Aug.	30 Sept.	
1933	2 0	40 0	50 0	10 Aug.	7 Oct.	
1934	2 0	30 0	40 0	10 Aug.	7 Oct.	
1935	1 6	22 6	30 0	10 Aug.	7 Oct.	
1936	1 6	17 6	30 0	5 Aug. ²	10 Oct.	
1937	1 6	15 0	30 0	5 Aug. ²	10 Oct.	
1938	1 6	15 0	30 0	5 Aug. ²	10 Oct.	
1939	1 6	15 0	30 0	5 Aug. ²	10 Oct.	
1947	2 0	20 3	40 6	5 Aug. ²	10 Oct.	
1948	2 0	20 3	40 6	5 Aug. ²	10 Oct.	
	With gyro s. d.	Without gyro s. d.				
1949	1 6	2 0	15 0	40 0	5 Aug. ²	10 Oct.
1950	1 0	2 0	10 0	40 0	26 July	10 Oct.
1951	1 0	2 0	10 0	40 6	26 July	10 Oct.
1952	9	2 0	7 6	40 0	23 July	10 Oct.
1953	9	2 0	6 8	40 0	23 July	10 Oct.
1954	9	2 0	6 8	40 0	23 July	10 Oct.
1955	9	2 0	6 8	40 0	23 July	15 Oct.

¹ The underwriters have always allowed an extension on payment of a surcharge on the additional premium. Since 1936 this has been five days on payment of a surcharge of 25 per cent.

² Subject to the proviso that no vessel may pass Cape Chidley before 10 August unless the Canadian Government patrol vessel has signalled that it is safe to do so.

There is no doubt that the Imperial Shipping Committee played a most important part in bringing new developments to the attention of the underwriters. Relevant information was assembled by the Committee, and the Chairman personally pointed out to the underwriters the deductions to be drawn therefrom. This was in fact done at the underwriters' request.

It is not possible to determine from the rates quoted how much allowance is being made for the ice risk, and how much for fog risk, navigational hazards, inadequate charting, or other factors such as expensive salvage. The ice factor is not treated separately by underwriters. The degree of importance they attach to this risk is therefore a matter for conjecture, but the Commonwealth Shipping Committee has devoted more attention to it than to other factors. It has rightly concentrated on the probability aspect of ice studies; that is to say, it has estimated the probable future behaviour of sea ice at given times and places on the basis of known past behaviour. It has had at its disposal considerable records of past experience. No great effort seems to have been made to search for more records (which certainly exist), but this was probably in any case impracticable. Analysis of all the available records by a competent specialist

is a step that might have been taken with advantage. In fact, the Canadian Department of Transport, which has provided most of the records, has not apparently made any special analysis of them; the National Research Council of Canada has recently been consulted, but only on the problem of effectiveness of radar in showing the presence of floating ice. The most authoritative opinion quoted in the *Reports* is that of the Port Manager at Churchill, given on the basis of his twenty-three years' experience there (*Eleventh Report* . . . , 1952, p. 11). This is of course valuable, but could be bettered. The tendency to attach too great importance to events of the previous season has been at times stoutly resisted; for instance, the ice encountered in July 1950 in Hudson Strait was held to be the result of the exceptionally severe preceding winter and was therefore not to be taken as an indication of what might happen in 1951. But on some occasions it has been difficult to avoid the feeling that a particular disposition of the ice in one season makes more likely its repetition in the next—a postulate that is quite without scientific justification. From the underwriter's point of view, however, this tendency is easily understood, since a large number of accidents in excess of his expectation in any one year is likely to increase his expectation of accidents in the next. Indeed, the underwriter's view normally is that statistics are the only reliable guide; conditions may change, he argues, but sooner or later this will be mirrored in the claims figures, and only then is it prudent to adjust the rates. Broadly speaking, however, the Committee has been pointing out demonstrable truths about the ice situation; and the underwriters have been acting upon them, but, as might be expected, in the most cautious way.

The Hudson Bay Route happens to be the best documented example of the processes involved in settling rates of additional premium for suspension of an *Institute Warranty*. It is unlikely to be typical, because the Commonwealth Shipping Committee has been constantly urging the underwriters to lower their rates; but it provides a good picture. For the other areas it is much more difficult to assemble information. As far as can be ascertained, the position is as follows.

The Baltic in winter time is the oldest established shipping route involving ice risks, and it is also the region where most is known about the behaviour of the ice. The rates of additional premium are scaled according both to region and time of year. There has been no change in rate since 1951. It seems that the rate here has more or less stabilized at the level which underwriters consider to be in conformity with their statistical experience. The same appears to be true of the White Sea, although there is much less incentive to send ships to this region when the ice is there. In the Scandinavian countries, however, the method of determining additional premiums is different from that used by the Joint Hull Committee.

For the Antarctic, rates were fixed by the Joint Hull Committee for the first time in 1955. Before that date, the amount of additional premium was a matter for negotiation between ship-owners and underwriters concerned, and figures are not available. Now, different rates are quoted for different areas and times of season. Since almost all the traffic up to now has been concerned with the whaling industry, the places and times quoted reflect this.

It has similarly not proved possible to obtain figures on the other areas: Greenland, the Kara Sea, Spitsbergen, the North Pacific and the approaches to the St Lawrence River in North America. In some cases the traffic is not yet sufficiently large or regular to cause the Joint Hull Committee to co-ordinate rates; while in the case of the Kara Sea route, all ships, which are on charter to the Soviet Government, are insured by the Black Sea and Baltic General Insurance Co., Ltd., a company associated with that government. Thus practice in these areas does not throw any light on the question as a whole.

We have been concerned so far with rates for particular places and times. The type of ship to be insured, and its likely performance in ice, is another factor. *Lloyd's register of shipping* has a notation "Strengthened for navigation in ice", which indicates conformity to certain structural requirements (see Appendix 2). There are of course many more grades of ice-worthiness: the Finnish Sjöfartsstyrelsen [Board of Navigation] distinguishes six, and the strongest of these still does not reach the icebreaker class, which could in turn be subdivided. The editors of *Lloyd's register of shipping* are now considering introducing further grades, based on the Finnish classification. But underwriters in general act only on the existing Lloyd's notation. Ships with that notation obtain a reduction of the additional premium for permission to go to the Antarctic. For other areas there is not a specific reduction; but the notation none the less plays a part because it influences the underwriter's decision on whether or not to accept the risk at all.

That, then, is the general picture as far as it can be established. Insistence by underwriters that their rates should be a reflexion of claims figures, rather than of conditions currently affecting shipping, has two results of interest to polar specialists. One is that rates are likely to remain high in seldom visited regions, however favourable conditions may in fact be known to be. The other is the time which must elapse, even in a fairly well-frequented area, between an alteration of circumstances—increased knowledge of natural conditions, better charts and so forth—and the reflexion of this alteration in the rate of additional premium. Normally the alteration is for the better (since knowledge tends to increase rather than diminish), so that the time lag acts in favour of the underwriter. Both these results are of course disadvantageous to pioneers in the polar regions.

Can the pioneer improve his position? As far as the first disadvantage is concerned, the experience of the Hudson Bay Route shows that the process of lowering rates is likely to be accelerated only in the case of a potentially important trade route, because only then will a powerful body like the Commonwealth Shipping Committee take an interest. Clearly this is not going to happen in many other places in the polar regions. Occasionally ship-owners risk running without insurance cover. This happened, for instance, in the case of the *Norbjørn* on a voyage to Spitsbergen in December 1956, when it was found that the premium demanded was so high that it exceeded the freight income.¹ But it does seem that the position could be made easier if under-

¹ *Press Bulletin* (Norway), No. 51, 1956, p. 3.

writers could be shown that knowledge of sea-ice behaviour has advanced and that some risks are much better known than is popularly supposed. In this connexion, it is worth while mentioning in particular the ice probability studies which have been, and are currently being, made at the Scott Polar Research Institute. These cover Canadian Arctic waters north of Hudson Strait, waters north of the U.S.S.R. and the waters of the Graham Land region of the Antarctic.

The second disadvantage—that of the time lag favouring the underwriter—is perhaps more intractable. This assumption is presumably one of the bases on which insurance is conducted, and it is not likely to be easily modified. But it is quite possible, in the case of sea ice, that an increase of knowledge may lead to a realization that the ice risk is greater than was thought. If this is so, the time lag will act in favour of the insured; and then, no doubt, it will disappear altogether.



Map showing waters barred to shipping by the *Institute Warranties*. The numbers in circles refer to the paragraphs of the *Warranties* (see Appendix 1 below).

APPENDIX 1

Institute Warranties

1. Warranted not to proceed to or from:

(a) Any port or place on the Atlantic coast of North America, its rivers or adjacent islands, north of lat. 43° 40' N., nor any port or place on the Great Lakes, other than

- (1) any port or place on the Atlantic coast of the United States of America, its rivers or adjacent islands;
- (2) the port of Halifax and, for bunkering purposes only, the ports of Louisburg and Sydney;

- (3) any port or place on the Atlantic coast of North America, its rivers or adjacent islands, north of lat. $43^{\circ} 40' N.$, south of lat. $52^{\circ} 10' N.$, but not west of Montreal provided that at no time between 1 November and 31 May, both days inclusive, shall the vessel be within that area west of long. $50^{\circ} W.$, except when proceeding directly between ports or places not excluded by this Warranty 1 (a).
- (b) Greenland waters.
- (c) Any port or place on the Pacific coast of North America its rivers or adjacent islands north of lat. $54^{\circ} 30' N.$, or west of long. $180^{\circ} 50' W.$
2. Warranted no Baltic Sea (or adjacent waters east of long. $13^{\circ} E.$)
- (a) North of a line between Mo (lat. $63^{\circ} 33' N.$) and Vasa (lat. $63^{\circ} 29' N.$) between 1 November and 20 May (b.d.i.) or
- (b) North of Stockholm-Reval (Tallinn) line or east of Reval (Tallinn) between 21 November and 5 May (b.d.i.) or
- (c) North of lat. $56^{\circ} N.$ between 15 December and 15 April (b.d.i.) except waters south of lat. $59^{\circ} N.$ and east of long. $22^{\circ} E.$ which are excluded between 1 December and 15 May (b.d.i.), but with liberty to sail to or from the port of Carlshamn only.
3. Warranted not north of lat. $70^{\circ} N.$ and no northern Russia.
4. Warranted no Bering Sea, no east Asian waters north of lat. $46^{\circ} N.$ and not to enter or sail from any port or place in Siberia except Nakhodka and/or Vladivostok.
5. Warranted not to proceed to Kerguelen and/or Crozet Islands or south of lat. $50^{\circ} S.$, except to ports and/or places in Patagonia and/or Chile and/or Falkland Islands, but liberty is given to enter waters south of lat. $50^{\circ} S.$ if en route to or from ports and/or places not excluded by this warranty.
6. Warranted not to sail with Indian coal as cargo:
- (a) Between 1 March and 30 June, both days inclusive.
- (b) Between 1 July and 30 September, both days inclusive, except to ports in Asia, not west of Aden or east of or beyond Singapore.

APPENDIX 2

Extract from *Lloyd's rules for steel ships*, chapter D, section 10 (in force in 1954).

Strengthening for navigation in ice

Framing

- 1001 Forward of the collision bulkhead intermediate frames having the scantlings given in Table 17 are to be fitted, extending from below the level of the floors to the deck next above the load waterline.
- 1002 Aft the collision bulkhead the main frames for a distance from the stem equal to $.15L$ are to be not less than required by D 905 to D 907 for a ship having a draught of $.06L$.

Intermediate frames having the scantlings given in Table 17 are to be fitted for a distance from the stem equal to $.10L + 25$ feet, but this distance need not exceed 65 feet. These intermediate frames are to extend from the margin or from below the top of the single bottom floors to the deck next above the load waterline; they need not be connected at their ends.

- 1003 The breadth of the shell flange of the frames is to be suitable for the riveting required by 1006.

Panting arrangements

- 1004 The requirements of D9 are also to be complied with, and the strength and stiffness of the framing system are not to be less than required for the actual draught of the ship.

Shell plating

- 1005 The thickness of the shell plating is to be increased from the stem to a position as far aft as the extent of the reinforced framing between 1 foot above the load waterline and 2 feet below the light waterline. The thickness is to be 65 per cent greater than the minimum given in Table 14, col. 11, but need not exceed 1 inch.

The shell plate in each strake immediately abaft the increased plating is to be intermediate between the full thickness required above and the normal thickness of side shell plating.

Riveting

- 1006 The diameter of the rivets used may be $\frac{1}{8}$ inch less than that required by Table 52A for the increased thickness of plating. The seams of the increased shell plating are to be double riveted.

Stringers

- 1007 Stringers of the scantlings shown in Table 16 spaced 6 feet apart are to be fitted forward and aft of the collision bulkhead. They are to be carried aft to the position at which the shell becomes of normal thickness.

Plate stems

- 1008 The thickness of the plates below the load waterline is to be 65 per cent greater than the thickness given in Table 14, col. 11, without correction, but need not exceed 1 inch; above the waterline the thickness may be tapered to that of the normal plate stem (see D307). Plates which require to be furnaceed are to have these thicknesses when finished. The spacing of the horizontal webs below the load waterline is not to exceed 3 feet.

Rudder and steering arrangements

- 1009 The diameter of the rudder head is to be 1 inch greater than required by Table 44. The scantlings of the rudder, the dimensions of the quadrant and tiller and the diameter of steering rods and chains are to be in accordance with the increased rudder head.

Screw shaft

- H227 The diameter of the screw shaft is to be increased 5 per cent above that determined by 211 and 212.

Propeller

- H228 The propeller or propeller blades are to be made of cast steel or other approved material. The material is to comply with the requirements of P9 or P14.

Sea valves

- E271 In ships having a notation for ice strengthening, the sea inlet and overboard discharge valves which are situated below the maximum load line are to be provided with connections from the boilers or compressed air receivers for clearing purposes. Low pressure steam or air is to be used for this purpose.
- E272 The scantlings of valves and valve stools fitted with steam or compressed air clearing connections are to be suitable for the maximum pressure to which the valves and stools may be subjected.

Acknowledgements

The author would like to express his warm thanks to Westralian Farmers Transport Limited for their help in the preparation of this paper.

THE BREEDING AND MAINTENANCE OF SLEDGE DOGS

BY R. J. F. TAYLOR

[MS. received 10 January 1957.]

CONTENTS

Introduction	page 429	Growth	page 435
The origin of F.I.D.S. dogs.	429	Colour	436
The dogs at Hope Bay in 1955	430	Psychology	437
Changes in the F.I.D.S. dogs	431	Comparison with mechanical transport	438
Care at base station	431	Conclusion	439
Sledging methods	432	Acknowledgements	439
Life-history and training	433	References	440
Breeding	434		

Introduction

One of the logical reasons for exploration is to collect the maximum of information in a specified time; therefore planning should be based on an appreciation of the pregnable gaps in as many fields of science as possible. Present Antarctic exploration is neglecting the biological sciences and in particular those of an experimental nature. Figures published¹ for the contingents from the British Commonwealth, France and Norway at present in Antarctica include twenty-three physicists, thirteen geologists of different varieties and only two biologists. This neglect probably arises from a too rigid conception that field biology is concerned with classification and with natural history. Antarctica, however, offers great possibilities, and even certain advantages, for much biological work, and in particular its simplicity helps ecological thought and nutritional experimentation.

The author was one of twelve men of the Falkland Islands Dependencies Survey (F.I.D.S.) stationed at Hope Bay in 1954 and 1955 as a "dog physiologist".² This paper emphasizes that sledge dogs offer unusual opportunities for biological investigation in a variety of fields.

The origin of F.I.D.S. dogs

There is considerable agreement that the Husky, the sledge dog of North America, is descended in the main from the Wolf and that this common ancestry has been further strengthened by mating Huskies with Wolves;³ the hybrid offspring are prized by Eskimos for their size and strength. The Wolf differs from the Husky in size, in having a single annual oestrus and in its drooping, and not erect, tail.

There have been three introductions of Huskies into the Falkland Islands Dependencies. Two shipments from Labrador arrived at the beginning of 1945⁴ and 1946.⁵ In 1945 about forty dogs came from the coast south of Hopedale

and in 1946 another forty from north of this settlement. These animals were not the best in the area, but rather the small and unwanted beasts.

In 1954, twenty-one dogs were shipped south; eleven of these had been selected as the best of the British North Greenland Expedition, 1952-54, pack; four more were their progeny; three dogs came from the Northwest Territories of Canada and three from Britain. The last trio were out of a Husky of Labrador parentage and the sire of one pup, although born in Labrador, had won fame in Graham Land as leader to V. E. Fuchs.⁶

The canine population of the Falkland Islands Dependencies is divided between the stations and has fluctuated in number between forty and 200. Dogs are frequently moved from station to station and must be considered as one and not separate breeding units. The population was isolated for 9 years, from the beginning of 1946 to the end of 1954, and during that time certain changes took place.

The dogs at Hope Bay in 1955

The material for this article comes from the dogs at Hope Bay in 1954 and 1955, and particularly in the latter year. There were then an average of seventy-five dogs, with a maximum of ninety-seven. During the year sixteen pups were reared, and another fifteen put down. Fourteen adult dogs were killed, thirteen of which were shot as they were unfit for sledging. (Four of these were 9 years old and too stiff and slow, six were of bad physique, small, stout and probably rachitic, one was blind, one had been permanently lamed in her youth, and one badly mauled in a fight and was dying. The fourteenth death was in a storm when a meteorological tower collapsed.)

The dogs can be classified by age and by origin. On 1 December 1955 the ages of the seventy-two dogs were:

Age in years	Males	Females
0-1	11	5
1-2	21	4
2-3	6	1
3-4	3	2
4-5	3	2
5-6	7	2
6-7	1	1
7-8	1	0
8-9	1	0
9-10	1	0
Totals	55	17

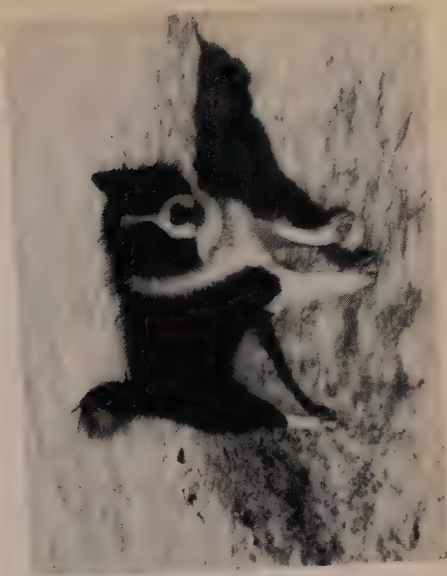
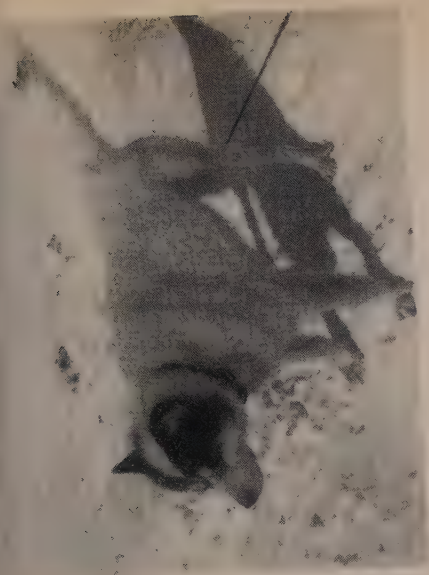
The average age was 2 years 9 months.

The origins and weights of the adult dogs were:

44 dogs of F.I.D.S. stock, Labrador origin	
Average weight of males	96 lb.
12 dogs from the British North Greenland Expedition	
Average weight of males	80 lb.
2 dogs from Canada	
Weight of male	85 lb.
1 dog of F.I.D.S. ancestry, but born in Britain	
Weight of male	101 lb.

The females were from 15 to 20 lb. lighter.

(The discrepancy in numbers is because 13 pups of mixed ancestry are not included, and 3 Greenland dogs, 1 Canadian and 2 from Britain were either dead or at other stations.)



Basic hereditary types of coloration in Huskies

(Facing p. 430)

NAME: SPARK

NO: H7989/50

DOG/BATCH Full brother
to SCROOP

BORN: 6.4.50

Father: MILES

No D3997/47

Mother: GERT

No.: D3036/45

Medical History:

20.12.54 Superficial scalp wound. Healed with
sulphonamide powder.
2.11.55 Prolapsed rectum, the size of an apple.
Disappeared in a week.

Characters:

GOOD:

Intelligent. Works well
but is sometimes abstracted.
Being trained as a leader.
Good average size.

G.W.M. 1.12.53

BAD:

Always ready for a
fight.

G.W.M. 1.12.53

Good leader.

W.T. 1.12.54



WORKING HISTORY: (position in team, major journeys, etc.)

Summer 1950-51. Short runs at Base H.
June-July 52. 300 miles. 3rd pair.
Aug-Sept 52. 370 miles. 3rd pair.
Oct-Nov 52. 330 miles. 3rd pair.
Intermittent
to Feb 53. 50 miles. 3rd pair.
May-July 53. 720 miles. 2nd pair.
Aug-Sept 53. 350 miles. 2nd pair.
Occasionally as leader.
Oct 53. 230 miles. 1st pair.
Dec 53-Jan 54. 200 miles. 1st pair.
May 54. 105 miles. 1st pair.
July 54. 60 miles. 1st pair.
August 54. 230 miles. 1st pair.
Sept-Oct 54. 360 miles. Leader.
Oct-Nov 54. 190 miles. Leader.
March-May 55. 205 miles. Leader.
June-July 55. 200 miles. Leader.
Aug-Oct 55. 900 miles. Leader.
Nov 55. 80 miles. Leader.

BASE TRANSFERS:

Left Base	Date	Arrived Base	Date
H	Feb 52	D	March 52

PROGENY: (by litter, names and numbers. Give name
and No. of other parent)

Out of MAGGIE H 7999/50. 8 born, 4 of
each sex. 8.12.53. Only one to adult.
JOSEPH D 3058/53/

Out of MILLIE D 3009/52. 8 born, 6 male
2 females. 2.4.55. 2 males kept but
one mauled and died, 9.5.55. Survivor,
SEAN D 3086/55.

Specimen of a Dog Card used by the Falkland Islands Dependencies Survey. The card is complete up to 1 December 1955 when Spark was 5½ years old. The entries under Medical History are taken from the card of Brindle, as Spark's card has no such entries. The Working History illustrates how the dog was moved gradually forward in the team.

Records of the F.I.D.S. dogs are kept on "Dog-cards". Each card has a picture of the dog and the following information: number, name, sex, date of birth, other dogs in the litter, sire, dam, medical history, notes on character, details of journeys and mileage, progeny, and movements from station to station. With the exception of "character" all the information is factual and therefore liable to little personal bias.

Changes in the F.I.D.S. dogs

Some three successive generations of dogs have been bred in the Antarctic and certain physical changes have taken place. These can be assessed from the written records and by comparing the "native" stock at Hope Bay with the Greenland and Canadian introductions.

The weight of northern Huskies is usually recorded as about 80 lb.,^{7,8} and this was the average weight of the Greenland introductions. The thirty-nine adult dogs at Base E on 17 January 1950 averaged only 74 lb. with 87 lb. as the maximum.⁹ However, dogs now bred in the Falkland Islands Dependencies average at least 95 lb. and the top weight recorded by the author was 132 lb.

The dogs from Greenland were as high at the shoulder as the "native" stock, both averaging 23 in., but the introductions had less bone and were thinner; average shoulder widths were 9 in. compared with 11 in. The Greenland dogs were also shorter, averaging 53 in. from nose to tail, compared with 60 in. The obvious physical changes during 9 years of closed breeding were therefore increase in weight, length, girth and thickness of bone, but with no great change in height. There was also a gain in strength but a loss of speed, and the process can be regarded as similar to breeding cart-horses from a racing stable.

These changes were probably due to better pup care and management, but other possible reasons are regular feeding, controlled selection of larger sires, and the fact that the dogs may carry more fat as the Antarctic summers are colder than those in the north. It is relevant that the dogs of Greenland origin now in Spitsbergen are reported to be as heavy as those at Hope Bay.¹⁰

Care at base station

At Hope Bay all dogs were kept spanned with the exception of young pups, breeding bitches and dogs under veterinary care. Apart from possible psychological effects, the only notable trouble with the span system was chafing of the necks by the collars. The spans were of wire rope with individual chains for each dog.¹¹ These 6-ft. long chains were spaced so that no dog could reach his neighbours. Rations were approximately 7 lb. of seal on alternate days, most of which was meat and blubber; heads, livers and kidneys were fed and sometimes hearts and lungs. About 230 seals, most of which were Crabeater Seals (*Lobodon carcinophaga*), were used in 1955.

Some authorities have condemned the feeding of offal on account of parasites. In the seals at Hope Bay the most obvious parasites were Nematodes, particularly in the stomachs of Weddell Seals (*Leptonychotes weddelli*). However,

the actual transference of seal parasites to dogs has not been demonstrated. Most parasites are highly specialized and only infect particular geographical neighbours. In the Antarctic there are normally no terrestrial mammals, and the suggestion that the parasites from the southern seals infect the introduced population of dogs is of remarkable interest, and requires investigation.

The health of the dogs at base was in general excellent. The conditions that were treated included:

Abcesses	4	Infected paws	2
Castrations	3	Intersusception	1
Cataract	1	Lacerations	1
Chafed necks	Multiple	Palatal ulcers	11
Infected lacerations	2	Prolapsed recta	3

Sledging methods

Sledging techniques used by F.I.D.S. have been well described by Adie¹¹ and by Bingham.¹² To-day, however, whips are rarely carried and drivers depend on the effect of verbal commands on the leading dogs. There are two aspects of leading: the dogs must go forward steadily and in a straight line, and secondly they must know, and respond to, the commands to change direction. The actual words used on F.I.D.S. have been standardized.¹¹ To turn left is *Irr-r-re*, to turn right *Auk*. Croft⁷ gives the Eskimo words as *Ille* for right and *Yuk* for left, i.e. there has been a transposition of these words when they were anglicized.

The aim in 1955 was to have teams of nearly equal strength and not to concentrate on certain crack teams. Thus no team, except the author's, was associated with one person but could be allocated to anybody for a particular journey.

The dogs were run in "centre-trace", with a leader followed by four pairs, and each team of nine included one or two bitches. In 1954 three teams were run all year and a fourth formed in the spring. During the summer of 1954-55, two of the four teams were sent to another station, and the Canadian and Greenland dogs landed at Hope Bay. The dogs from Greenland had been trained, but we failed to make them pull together satisfactorily. Thus in March 1955, when only two teams were left at Hope Bay, the dogs were reorganized to form four teams of roughly equal strength. Two old dogs were withdrawn from the original teams and pups put in their places; the Greenland dogs were drafted into three of the four teams. In August a fifth team emerged after another regrouping, and the process was repeated in December. Thus by removing trained dogs to form the nuclei for new teams, and replacing them with pups the number of teams was increased from two to six. We found this easier and more satisfactory than trying to force nine pups to run together.

The teams were strong but some leaders were poor and inexperienced. This was a result of the many young dogs, and of the increase in number of teams. Routine was so complex that no training runs were possible, and in fact all the training was done while on journeys. One dog had been in harness only half an hour before starting on a 360 mile journey.

Sledging took place throughout the year, although distances were restricted in summer and autumn by lack of sea ice. During these seasons the dogs were used to haul stores and seals from the beach to the hut. The longest journey in 1955 was 890 miles; there were three others over 200 miles and four more of over 100. The maximum mileage credited to a dog in the year was 1390. Most journeys averaged 10 miles a day, but in 1954 one journey of 110 miles averaged only 6, while another of 325 miles averaged 16 miles a day.

Sledges were 12 ft. "Nansen type" with "Tufnol" runners. A loaded sledge was assumed to weigh 1100 lb., but on two occasions the load itself was well over 1300 lb. A few experiments were done with runners of Polytetrafluorethylene.¹³ No difference was found between the coefficient of sliding friction of runners covered with this plastic and of new ones of "Tufnol", at 0° C. After much use, say 3000 miles, the drag of "Tufnol" runners increased by approximately 30 per cent.

Life-history and training

There were four stages in the life of the dogs at Hope Bay. First, infancy. Birth was in a large indoor kennel attached to the living hut. The dam was kept with her pups for 6 weeks and the pups first went outside at between 4 weeks old and 3 months. They then roamed free until spanned. During the second stage, from 6 to 10 months, the pups were tethered on the spans, fed seal every other day, and never worked. The third stage, working life, usually lasted 7 years (but Yap, an exceptional dog, was sledging until he was 10). This period can be divided into time at base and time on journeys. At base the dogs were fed every other day and worked perhaps once in 10 days in winter, more frequently in the summer. During journeys the dogs were fed daily and worked perhaps 8 days in 10. A good dog might spend nearly as much time travelling as at base, and cover 8000 miles during his working life. Finally, when 9 years old most dogs were retired and shot. There are records of sledge dogs living to 15 in Britain.

Thus after the first 6 months the dogs were tethered for the rest of their lives. They were dependent on man for all food and exercise, and the human control even extended to their sexual activity. The author believes such a relationship to be bad, and that the dogs suffered from boredom while on the spans which may have weakened their "mental stamina". Hediger¹⁴ suggests the same for animals in zoos.

In contrast with previous practice, we did little training of pups. They were put in harness at the back of a team and left there alone; often two pups of the same litter started sledging together and we tried to maintain such pairs. Gradually they learnt to pull and to understand the words of command. It seemed that the major part of their training came from watching and imitating older dogs.

Some dogs were run at 7½ months; two pups of 9 months went well on a spring journey of 390 miles and two other pups of 15 months did the 890 miles journey. It is thought, however, that these pups were too young and that dogs

under 12 months old should be limited to journeys shorter than 200 miles, and while under 2 years to journeys shorter than 500 miles. It is the opinion of the author that F.I.D.S. dogs are in their prime when 5 years old.

Breeding

The breeding policy at Hope Bay in 1955 was based on three factors: the conception of an "ideal Husky", an attempt to cross the four strains of dog at the station, and the necessity to limit the numbers of pups. More bitches were put down at birth than dogs. Some of our premises were a nine-dog team, a loaded sledge of half a ton, 1 lb. a day of "Bovril dog pemmican", most journeys shorter than 50 days, temperatures usually between -1.1°C . (30°F .) and -28.9°C . (-20°F .) and never below -45.5°C . (-50°F .). There are arguments both for large and for small dogs. The relative reduction in heat loss with increasing size is offset by a decrease in speed and also in reliability; for the loss of a single dog would be more serious from a team of eight than from one of ten smaller dogs.

We considered that the physical qualifications to fit the premises were: medium weight, long legs, narrow hips (which seem to be associated with speed) and a short, thick and even coat. Ideal measurements were thought to be:

Weight	90 lb.	Shoulder width	10½ in.
Nose-to-tail length	60 in.	Hip width	8 in.
Shoulder height	23 in.		

Most of our dogs did not fit these measurements, many were too large. Eight dogs were chosen as potential sires and care was taken to avoid close relationships in selecting the sire for each bitch.

From a study of the records of Stonington Island⁹ and of those at Hope Bay, the following conclusions emerged. Oestrus was roughly every 6 months but sometimes was highly irregular. One bitch, Ginny, was served in the third week of April, the second week of August and the first week of December, but she only became pregnant after the first and third periods. Oestrus was more marked in summer than in winter, but the actual occurrence was not seasonal, i.e. as many bitches came on heat in one season as in the other three. The presence of bitches on heat seemed to stimulate the onset of heat in other bitches approaching their time, but not yet due.¹⁵ The time of acceptance was usually longer in summer than in winter and varied from 2 to 10 days. Some dogs appeared uninterested in serving bitches, but this characteristic had no apparent relation to size and strength, two qualities often considered masculine.

There are records of pregnancy from 57 to 74 days, but around 64 from the first acceptance was normal. The average litter-size, from 42 litters, was 6.05; extremes were 1 and 9, with one record of 14. The details from Stonington Island were collected 5 years before those from Hope Bay; but there is no significant difference in the average litter-size between the two sets of records, i.e. no evidence of a decrease in fertility due to the closed breeding was obtained.

Many litters were not sexed, but 16 litters contained 57 dogs and 43 bitches: a sex ratio at birth of 132 to 100. Both sexes were proved fertile at 9 months. However, bitches gave a strong impression of oestrus when 5 months old and dogs copulated at that age. No full sisters were ever recorded coming on heat at the same time.

Growth

To obtain a standard for growth, thirty-five pups from eleven litters were weighed. The most regular figures, however, came from one litter of four dogs (Fig. 1 and Table 1). These animals are still alive and remarkably alike.

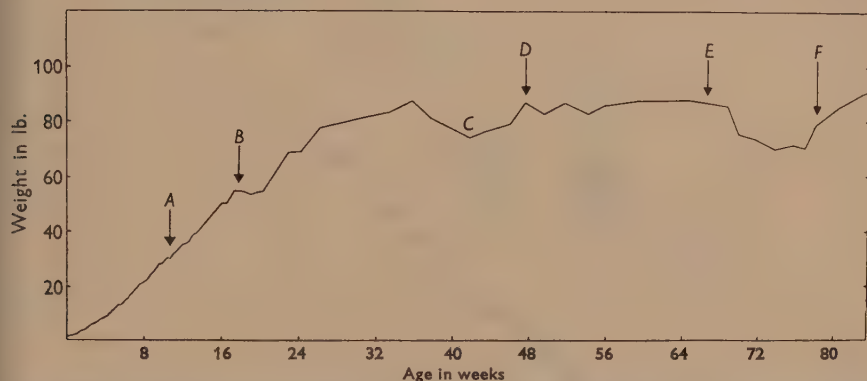


Fig. 1. Weight changes of two of the four pups in the standard litter. *A*, once daily feeding started; *B*, pups put on span; *C*, hot summer and shortage of seal; *D*, pups started work; *E* to *F*, the journey of 890 miles.

Table 1. *The weights of four brothers whose growth was adopted as a standard*

(Date of birth, 28 April 1954. Weight of parents, 75 and 70 lb. Final weight of the brothers was about 95 lb. each.)

Age		Weight		Age (weeks)	Weight (lb.)
Weeks	Hours	lb.	oz.		
	24	1	10	9	24
1		2	10	10	27
2		4	7	11	31
3		6	11	12	35
4		9		13	38
5		12		16	50
6		15		52	86
7		18		83	94
8		21			

Although they are a little large, they developed into satisfactory draught animals. They reached half their final weight when approximately 15 weeks old, and 90 per cent at the end of one year. Their progress was adopted as a standard in assessing the growth of other pups.

In some litters only one pup was kept, in others any number up to six. On the whole the individuals in the large litters grew as fast and were as heavy as those from smaller litters, suggesting that the size of the litter need have no effect on growth or on the adult weight.

At certain stages, changes in the surroundings of growing pups are inevitable; the dam has to be removed, feeding reduced from three times to once daily, the pups sleep outside for the first time and also have to be spanned. It was found that almost any change in the surroundings produced a retardation of growth;

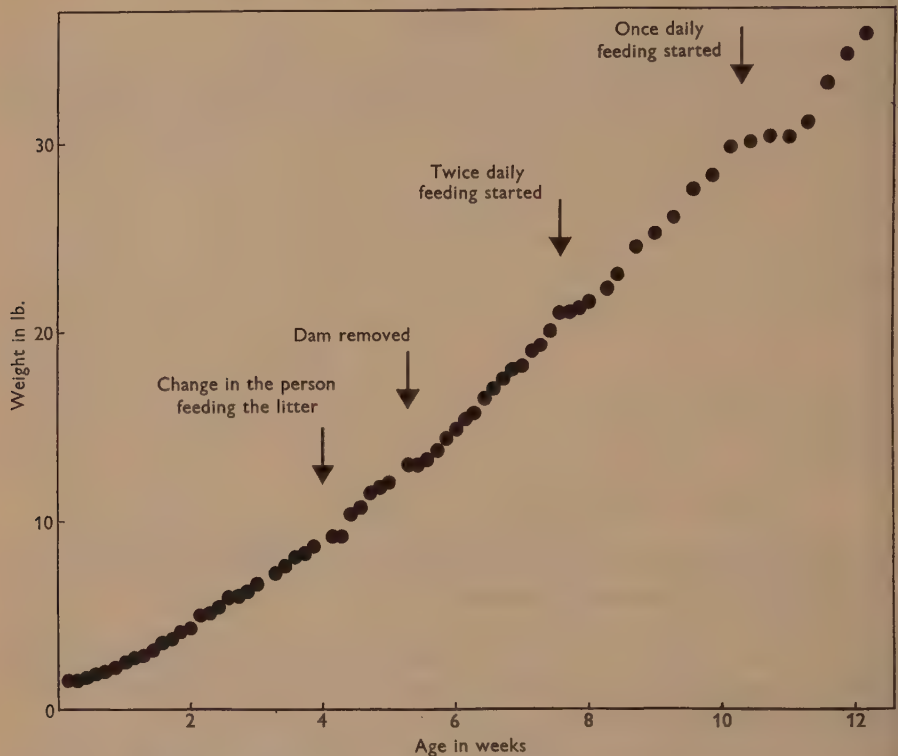


Fig. 2. Changes in body weight of one pup, D3066/54, showing that each change in environment produced a temporary retardation of growth.

a new person feeding the pups produced considerable effect as did putting them on the spans for the first time (Figs. 1 and 2). One litter of average weight at birth was 2 weeks behind "standard" 6 weeks later. After a further 11 weeks the deficit had been cleared and thereafter growth was normal. It seems that the effect of these retardations can be overcome by adequate care and management.

Colour¹

The dogs at Hope Bay were a variety of colours, ranging from white to black and including grey, red and piebald dogs; only one was dun-coloured. Certain basic hereditary types were recognizable and these could be fitted into a series suggesting increasing dominance of black pigments whose centres were fixed¹ (Fig. 3). This series starts with a pure white dog. The second stage has black on each ear with a white dividing line on the forehead and the remainder of the

¹ See photographs facing p. 430.

body white. In the third the black spreads on the head and to the hips and thighs. The white on the forehead may remain as a dividing line around a dark ace, and sometimes white spots remain above or below the eyes. In the fourth the black covers the majority of the body, but the shoulders, chest and fore limbs usually have more white than the rear limbs and the hips. Finally the

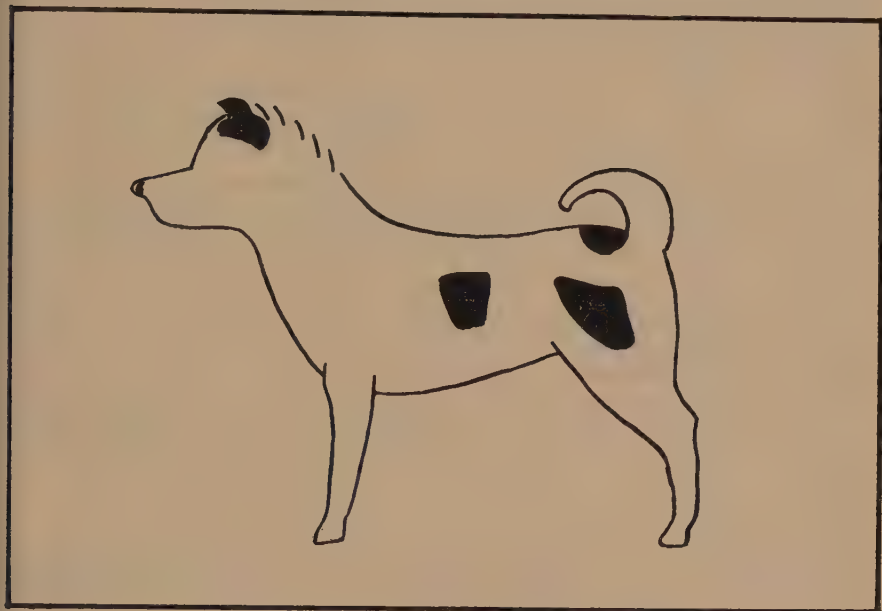


Fig. 3. The centres of pigmentation in a Husky.

major part is black, and white tends to remain only on the muzzle, the chest and belly, on the pads and on the tip of the tail. This series indicates seven centres of pigmentation, one on each ear, flank and thigh and one centrally on the rump.

The simple scheme was distorted in three ways. First, sometimes the pattern was asymmetrical; secondly, the whites and the blacks often were not pure colours but greys tinged with reds and with yellows; and thirdly, some dogs were red. These red animals had at least one black parent, and black appeared to be dominant both to red and to white. One litter from a nearly black bitch and a white dog contained four pups; one pup was white, one black, one pure red and the fourth piebald with approximately equal areas of black and white.

The conclusion was that at least two sets of genes must be involved in the inheritance of colour patterns.

Psychology

It has been suggested that the F.I.D.S. system of maintaining the dogs may result in a deterioration of mental stamina due to boredom on the spans and to continual control by man. The importance of such a belief was demonstrated during the journey of 890 miles where most of the travel was over the flat and

monotonous Larsen Ice Shelf. During the two months on the concentrated diet the dogs suffered badly from malnutrition due to insufficient rations and the poor balance of the diet.¹⁶ The useful work output of the team gradually dropped from around 800 calories an hour to less than half this figure.¹⁷ But at certain periods the poor performance was relieved by spurts when their work output approached the theoretical maximum. These spurts were occasioned by some stimulus recognizable by the drivers of the dogs, such as a visual objective, the smell of seals or birds, wind after calm, calm after wind and certain variations in snow surface; in fact most changes in the environment produced an increase in output. On Day 49 we travelled 25 miles and during the last 5 times runs of the day the dogs worked at rates equivalent to 62, 51, 75, 86 and 94 per cent of their maximum. The particular stimuli for this increase in performance were a rock objective, a change from flat, smooth snow to irregularities and uphill, and a rise in human morale shown by the singing of Christmas carols. On Day 76, in the hour immediately before their first feed of seal, the dogs pulling the author's sledge were producing 88 per cent of their theoretical maximum. It was concluded that the decrease in work output that could be attributed to the biochemical deteriorations at no time exceeded 15 per cent and that greater losses must be due to some mental change, such as boredom. It would seem therefore that during this particular journey psychology played a bigger part than physiology in determining the variations in the performance of the dogs.

This conclusion is obviously of first importance in any breeding policy. In the scheme adopted at Hope Bay in 1955 far more emphasis had been laid on physical than on mental qualities. Our experience showed the importance of psychology and therefore we argued that there should be three grades of sledge dog: dogs for pulling, dogs to go forward steadily as leaders over monotonous country, and leaders for difficult travel where sudden and accurate changes of direction are required. It may well be that intelligence is only required for leaders over sea ice or crevassed country, and that stupidity is a virtue in pulling-dogs and in leaders for dull and monotonous travel.

The actual relationships between dogs suggested parallels to human feelings: love, affection, jealousy, fear, respect, irritation, even humour appeared to be shown by the dogs. There are advantages in examining the simplest pattern of any organization and probably canine psychology is simpler and therefore more rewarding than that of humans.

Comparison with mechanical transport

Figures are available for the performance of the vehicles used by the Norwegian-British-Swedish Antarctic Expedition in 1950 and 1951.¹⁸ Their "Weasels" which had been supplied by the British army proved successful. During the two years in Antarctica they travelled a combined total of 6500 miles—the comparable figure for the distance travelled by dog teams from Hope Bay in the twelve months of 1955 was 4000 miles. Tables 2 and 3 present the performance of both and demonstrate that in general mechanical vehicles are now far superior.

For some purposes dogs are still superior. In coastal areas they can live "off the land"; they are probably easier to maintain and obviously, for a long-term venture, they are far cheaper. Planning and preparation of expeditions is

Table 2. *Performance of the mechanical vehicles of the Norwegian-British-Swedish Expedition, 1949-52*¹⁸

	Average	Maximum
Pay load in lb. (a) of the vehicle	900	1800
(b) of the towed sledge	6000	9000
Miles per gallon, with sledge behind	2	3
Speed in miles per hour (a) alone	—	30
(b) with sledge behind	6	—
Approximate unsupported range in miles	1500	2000
Excess load in lb. if range limited to 1000 miles	2500	5000
Approximate cost in shillings of travelling 1 mile	1	—
Approximate cost of vehicle in pounds sterling	1500	—

Table 3. *Performance of a team of nine dogs*

	Average	Maximum
Pay load in lb.	900	1200
Miles per day	10	40
Speed in miles per hour	4	—
Approximate unsupported range in miles	600	1000
Approximate cost in shillings of travelling 1 mile	4	—
Cost of dogs	0	—

simpler with dogs and their performance is less affected by variations in terrain and in weather. In effect, dogs still remain a simple and reliable means of polar transport, although one of the slowest.

Conclusion

The heyday of sledge dogs was at the beginning of this century when they took Peary to the North Pole and Amundsen to the South Pole. To-day their utility is declining but they can still make a considerable contribution to polar expeditions, both as traction engines and also as laboratory animals.

The morale of men and dogs while sledging is closely related, and the psychological attitude of the dogs plays a large part in controlling the variations in their performance. Instinctive behaviour patterns are probably more clearly shown in Huskies than in domestic breeds of dog. In addition to many aspects of behaviour and psychology, topics particularly suited for research are the factors affecting colour, growth and form in mammals, exact feeding requirements, and the relation between nutrition and muscular performance.

Acknowledgements

I would like to thank two people who have given me much assistance: K. V. Blaiklock, who introduced me to Huskies, and N. A. G. Leppard, with whom I travelled a considerable distance.

References

- ¹ The Trans-Antarctic Expedition, 1955-58, and The International Geophysical Year, 1957-58. *Polar Record*, Vol. 8, No. 55, 1957, p. 356-61.
- ² R. J. F. TAYLOR. The physiology of sledge dogs. *Polar Record*, Vol. 8, No. 55, 1957, p. 317-21.
- ³ S. P. YOUNG, and E. A. GOLDMAN. *The wolves of North America*. Washington, 1944.
- ⁴ J. M. WORDIE. The Falkland Islands Dependencies Survey, 1943-46. *Polar Record*, Vol. 4, No. 32, 1947, p. 372-84.
- ⁵ E. W. BINGHAM. The Falkland Islands Dependencies Survey, 1946-47. *Polar Record*, Vol. 5, No. 3, 1947, p. 27-39.
- ⁶ V. E. FUCHS. Exploration in British Antarctica. *Geographical Journal*, Vol. 117, No. 4, 1951, p. 399-421.
- ⁷ A. CROFT. West Greenland sledge dogs. *Polar Record*, Vol. 2, No. 13, 1937, p. 68-81.
- ⁸ C. L. B. HUBBARD. *Working dogs of the world*. London, 1947, p. 175.
- ⁹ R. J. ADIE. The 1949-51 dog report from Base E (Stonington Island) of the Falkland Islands Dependencies Survey. Unpublished.
- ¹⁰ A. REECE. Sledge dogs of the Norwegian-British-Swedish Antarctic Expedition, 1949-52. *Polar Record*, Vol. 7, No. 47, 1954, p. 32-37.
- ¹¹ R. J. ADIE. Sledge dogs of the Falkland Islands Dependencies Survey, 1947-50. *Polar Record*, Vol. 6, No. 45, 1953, p. 631-41.
- ¹² E. W. BINGHAM. Sledging and sledge dogs. *Polar Record*, Vol. 3, No. 21, 1941, p. 367-85.
- ¹³ F. P. BOWDEN. Friction on snow and ice. *Proceedings of the Royal Society A*, Vol. 217, 1953, p. 462-78.
- ¹⁴ H. HEDIGER. *Wild animals in captivity*. London, 1950, p. 158.
- ¹⁵ M. BURNS. *The genetics of the dog*. Commonwealth Agricultural Bureau, Slough, 1952, p. 12.
- ¹⁶ R. J. F. TAYLOR, A. N. WORDEN, and C. E. WATERHOUSE. The sledging rations of sledge dogs. *British Journal of Nutrition* (in the Press).
- ¹⁷ R. J. F. TAYLOR. The work output of sledge dogs. *Journal of Physiology* (in the Press).
- ¹⁸ C. SWITHINBANK. Mechanical transport of the Norwegian-British-Swedish Antarctic Expedition, 1949-52. *Polar Record*, Vol. 6, No. 46, 1953, p. 765-74.
- ¹⁹ The Falkland Islands Dependencies Survey, 1954-55. *Polar Record*, Vol. 8, No. 54, 1956, p. 260-64.

THE "PRAIRIE ICE JIGGER"

BY W. M. SPRULES

[MS. received 21 January 1957.]

CONTENTS

Introduction . . .	page 441	Operation . . .	page 443
Construction . . .	441	Modifications . . .	444

Introduction

The term "prairie ice jigger" is a local name given by fishermen of western Canada to a simple but ingenious apparatus used to facilitate setting gill nets beneath an ice surface. A jigger consists of a board and two levers so arranged that a backward pull on a line attached to one lever is translated into a forward thrust which propels the board along beneath the ice. Thus only two holes need be chopped through the ice to set a standard net, and several nets can be set in different directions from any one hole. This represents a considerable saving in time and effort when compared with other methods such as pushing a pole with an attached line from hole to hole until sufficient line has been let out to accommodate a net. The jigger is almost a necessity to fishermen operating in northern areas of Canada, where winter fishing is carried on for several months beneath an ice cover which varies from several inches in thickness to as much as six feet.

The origin of the jigger apparently dates back to about 1912, when a fisherman-blacksmith built the prototype for his own use on Lake Manitoba. Since that time many improvements in design have been devised to permit more efficient operation, but the principle is still fundamentally the same as in the original. The use of the jigger has spread throughout the prairie provinces and Northwest Territories with the recent development of commercial winter fisheries, and in Quebec has reached as far north as Ungava Bay with Fisheries Research Board parties. A few Eskimo families along the west coast of Hudson Bay now possess jiggers. Although jiggers can be purchased at nominal cost from several companies specializing in commercial fishing equipment, many fishermen prefer to construct their own, using scrap materials which are readily available around most winter camps.

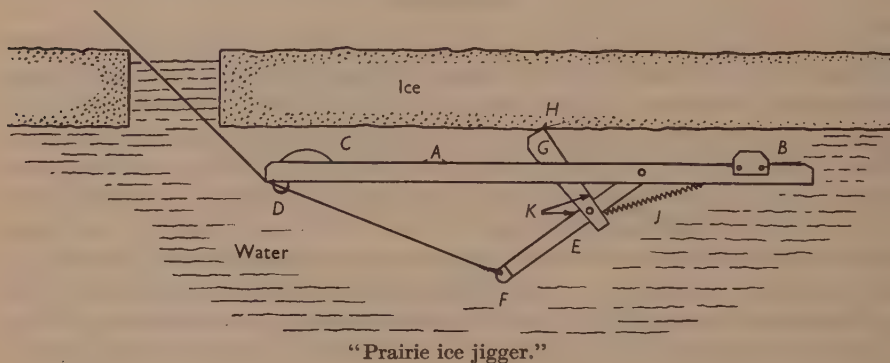
Construction

Component parts. The main body of the jigger consists of a wooden board (A)¹ approximately 9 ft. long, 10 in. wide and $1\frac{3}{4}$ in. thick. Any wood is suitable, provided that it is light and well seasoned. A slot is cut along the middle of the width of the board, 2 in. wide and 34 in. long, beginning 26 in. from the back

¹ See illustration on p. 442.

end. At the front end, the slot is continued for a further 3 in., but only $\frac{1}{2}$ in. wide. A hole is drilled from one side of the board to the other through the centre of the narrow slot. A metal plate (*B*), about 4 in. long, is screwed to each side of the board near the front end; these plates assist the jigger to move smoothly against the ice. A small centre guide (*C*), made of wood sheathed with metal, is attached to the upper surface of the back end of the board. A metal staple (*D*) is driven into the centre of the undersurface of the board at the back end; this acts as a guide for the line.

An iron bar (*E*), 27 in. long, 1 in. wide and $\frac{1}{4}$ in. thick, has a small loop of iron rod (*F*) brazed on to one end. Two holes, $\frac{1}{2}$ in. in diameter, are bored through the middle and the upper end of the width of the bar.



A wooden arm (*G*), 22 in. long and $1\frac{1}{2}$ in. thick, is tapered from 4 in. in width at one end to 2 in. at the other. The corners are removed from the 4 in. end. In place of one corner a sharpened metal spike (*H*) is embedded in the arm. A slot, 4 in. long and $\frac{1}{2}$ in. wide, is cut down the middle of the thickness of the arm at its narrow end. A hole, $\frac{1}{2}$ in. in diameter, is bored through the middle of the slotted section of the arm.

In order to allow for free movement of the iron bar which is bolted to the arm through the slot, grooves (*K*) $\frac{1}{2}$ in. wide are chiselled from the upper end of the slot, reaching the edges of the arm about 12 in. farther up.

A strong, 17 in. spring (*J*) attaches the iron bar (*E*) to the forward end of the main board (*A*).

Assembly. The upper end of the iron bar (*E*) is placed in the narrow end of the slot in the main board (*A*), and fixed with a $\frac{3}{8}$ in. bolt. Washers are placed on each side of the iron bar inside the slot and both ends of the bolt countersunk in the board. The iron bar (*E*) is then placed in the slot at the narrow end of the arm (*G*) which is slid down to the middle of the iron bar (*E*) and similarly bolted there. The arm (*G*) is then placed through the slot in the board (*A*) with the spike (*H*) facing forwards.

One end of a line, about 110 yd. long, is passed through the staple (*D*) and attached to the iron loop (*F*).

Operation

In order to run under the ice a line which can be used to set a gill net, a hole not less than 2 ft. square is chopped through the ice. The jigger is pushed through this hole with its upper side against the underside of the ice, and its front end pointing in the approximate direction in which the net is to be set. The line should be pulled taut so that the iron bar is pulled back against the board (*A*). This insures that the wooden arm (*G*) is through the slot in the wooden board (*A*) and will be in the proper position. The line should be long enough to accommodate the various nets that are to be set. Approximately 110 yd. is required for standard 45-fathom nets. If shorter nets are to be set it is convenient to mark the line at intervals.

The operator remains at the hole and propels the jigger forward by means of a series of sharp pulls on the line. The line should be pulled until considerable resistance is felt and then quickly released and allowed to run through the fingers. This procedure is followed until sufficient line has been paid out. The amount of pull required increases as the distance of the jigger from the hole increases, depending on the amount of stretch in the line. If a long line is being set, the operator will probably have to grasp the line firmly in the final stages, pass it over one shoulder and run backward a few steps until the proper strain is felt. The line is then released and the operation repeated.

Experience is required to operate the jigger efficiently since if the pull on the line is too hard, or is maintained too long, the jigger will be dragged down into the water and will "trip" the wooden arm. The arm will then point forward instead of backward and the spike will no longer make contact with the ice and serve as an anchor for the lever action. If this occurs it is necessary to pull the jigger back to the hole, re-position it, and start again.

When the jigger is placed beneath the ice its buoyancy causes it to float against the underside of the ice. The weight of the iron bar causes this part to assume a vertical position since it moves freely about a fixed pivot. The wooden arm floats against the underside of the ice with the metal spike in contact with the ice. When the line is pulled the metal bar is pulled backward, the wooden arm is thrust upwards and the spike penetrates the ice, preventing backward movement of the jigger. As the metal bar continues backward the jigger shoots forward a short distance. At the same time the line is let out and the metal bar returns to the vertical, with the wooden arm sliding along with the jigger as momentum carries it forward.

The jigger cannot be seen while in operation and, since it must be accurately located after it has travelled the required distance, fishermen generally operate in pairs with one man propelling the jigger and the other following its path by listening for the sound of the spike digging into the ice. When sufficient line has been stretched under the ice a second hole is chopped at the point indicated by the second fisherman, and the jigger is pulled through this hole. One end of a standard 45-fathom gill net is then attached to the line at one hole and the net is drawn into position under the ice by pulling the line through the second hole. Small anchors are attached to both ends of the net and dropped through the

holes to stretch it in proper fishing position on the bottom. Lines extend from the net and are attached to marker poles driven into the ice or snow beside the holes. The long line which was used to pull the net into position is then removed and the operation is completed.

The time required varies with the thickness of the ice to be chopped, and the accuracy with which the jigger's path is followed.

Modifications

The basic design for the jigger has changed very little over the years, but the following modifications have proved useful. Although long jiggers may move on more accurately under the ice, a short jigger is much easier to transport. Since one of the chief difficulties is locating the jigger after it has moved for some distance under the ice, various devices have been invented to overcome this difficulty. These include noise makers and lights attached to the jigger for day and night operations respectively.

FIELD WORK

INTERNATIONAL GEOPHYSICAL YEAR, 1957-58: ARCTIC, 1957

[From papers of the C.S.A.G.I. Arctic Conference, Stockholm, May, 1956.]

Very few stations are being set up in the Arctic regions specifically in connexion with the International Geophysical Year. Observations are being taken at about seventy-four centres north of the Arctic Circle, but in almost all cases already established weather stations are being enlarged and adapted for the purpose. This note refers only to stations north of the Arctic Circle.

In addition to world days, the following disciplines are being observed: 1, meteorology; 2, geomagnetism; 3*a*, aurora; 3*b*, airglow; 4, ionosphere; 5, solar activity; 6, cosmic rays; 7, longitudes and latitudes; 8, glaciology; 9, oceanography; 10, rockets and satellites; 11, seismology; 12, gravimetry.

Canada

Canada is to operate seven stations north of the Arctic Circle with the following disciplines (see key in first paragraph):

		Disciplines
Hazen Lake	lat. 82° N., long. 70° W.	8
Arctic Bay	lat. 73° N., long. 85° 18' W.	1
Clyde	lat. 70° 27' N., long. 68° 33' W.	1
Aklavik	lat. 68° 14' N., long. 135° W.	1
Hall Lake	lat. 68° N., long. 82° W.	1
Coppermine	lat. 67° 47' N., long. 115° 15' W.	1
Padlovo	lat. 67° N., long. 62° 8' W.	9

Canada is also operating six stations in collaboration with the United States; for details of these see under United States.

Denmark

The six stations to be operated by Denmark in Greenland are:

		Disciplines
Nord	lat. 81° 36' N., long. 16° 40' W.	1, 3 <i>a</i> , 11
Thule	lat. 77° 29' N., long. 69° 10' W.	2
Danmarks Havn	lat. 76° 46' N., long. 18° 46' W.	1, 3 <i>a</i>
Kap Tobin, Scoresbysund	lat. 70° 25' N., long. 21° 58' W.	1, 3 <i>a</i>
Godhavn	lat. 69° 15' N., long. 53° 31' W.	2, 3 <i>a</i> , 4, 6
Egedesminde	lat. 68° 42' N., long. 52° 52' W.	1

See under United States for details of the station to be run jointly with that country.

Finland

The following disciplines will be observed from Sodankylä, in lat. 67° 22' N., long. 26° 39' E.: 1, 2, 3*a*, 4 and 11.

Norway

Eight northern stations will be operated by Norway:

		Disciplines
Ny Ålesund, Spitsbergen	lat. 78° 56' N., long. 11° 56' E.	11 and 12
Isfjord, Spitsbergen	lat. 78° 04' N., long. 13° 38' E.	1
Longyearbyen, Spitsbergen	lat. 78° 15' N., long. 14° 30' E.	3 <i>a</i> and 4
Bjørnøya	lat. 74° 31' N., long. 19° 01' E.	1 and 2
Jan Mayen	lat. 71° 01' N., long. 08° 38' W.	1
Skattøra, Norway	lat. 69° 42' N., long. 19° 01' E.	1
Tromsø, Norway	lat. 69° 40' N., long. 18° 57' E.	1, 2, 3 <i>a</i> , 3 <i>b</i> , 4 and 6
Karasjok, Norway	lat. 69° 28' N., long. 25° 31' E.	1

A joint working group of meteorologists from Denmark, Finland, Norway and Sweden is to be set up in Oslo during the International Geophysical Year.

Sweden

Five northern stations will be operated by Sweden:

		Disciplines
Abisko, Sweden	lat. 68° 21' N., long. 18° 49' E.	2 and 3a
Kebnekaise, Sweden	lat. 67° 55' N., long. 18° 35' E.	8
Kiruna, Sweden	lat. 67° 52' N., long. 20° 40' E.	2, 3a, 4, 6 and 11
Kiruna, Sweden	lat. 67° 50' N., long. 20° 26' E.	2, 3a, 4, 6 and 11

See under United States for details of the station to be run jointly with that country.

United States

United States activities can be divided into three areas: (1) Alaska, (2) two drifting stations, and (3) stations run jointly, or in co-operation, with other countries.

(1) Three stations in Alaska are north of the Arctic Circle:

		Disciplines
Point Barrow	lat. 71° 20' N., long. 156° 46' W.	1, 2, 3a, 4, 8, 9, 11 and 12
Barter Islands	lat. 70° 08' N., long. 143° 40' W.	1, 2, 9 and 12
Brooks Range	lat. 69° N., long. 144° W.	8

(2) Drifting station A lat. 78° N., long. 160° W. (initially) 1, 2, 3a, 4, 8, 9 and 12
 Drifting station B lat. 85° N., long. 100° W. (initially) 1, 8, 9 and 12

(3) United States men and equipment will be included at eight stations:

United States-Canadian

Alert	lat. 82° 33' N., long. 62° 35' W.	1, 2, 3a, 4 and 12
Eureka	lat. 80° 13' N., long. 86° 11' W.	1 and 12
Isachsen	lat. 78° 47' N., long. 103° 32' W.	1
Mould Bay	lat. 76° 17' N., long. 119° 28' W.	1 and 12
Resolute	lat. 74° 43' N., long. 94° 59' W.	1, 2, 3a, 3b, 4, 6, 9, 11 and 12

Sachs Harbour lat. 72° N., long. 122° W. 1

United States-Denmark

Greenland Ice Cap lat. 77° N., long. 64° W. 8

United States-Sweden

Kiruna lat. 67° 50' N., long. 20° 15' E. 11

Stations outside the United States are being maintained by the United States at:

"Thule Air Base", Greenland	lat. 76° 33' N., long. 68° 50' W.	1, 2, 3a, 3b, 4, 6, 11 and 12
Davis Strait (shipboard)	lat. 67° N., long. 58° W.	2, 3a, 3b, 4, 9, 10 and 11

U.S.S.R.

The U.S.S.R. plans to designate thirty-four stations north of the Arctic Circle as I.G.Y. stations. Two of these will be drifting stations and most of the remainder are currently operating polar stations.

The number of stations to make observations on each discipline is as follows: meteorology, 19; geomagnetism, 9; aurora, 20; airglow, 3; ionosphere, 4; solar activity, 1; cosmic rays, 4; glaciology, 3; oceanography, 3; seismology, 2.

Arctic expeditions in connexion with the I.G.Y., 1957

A Swedish-Finnish-Swiss expedition to Nordaustlandet, 1957-58. The base of the expedition, which is to be led by G. A. Liljequist, will be on the shore of Kinnvika, at the mouth of Murchisonfjorden, in lat. 80° 03' N., long. 18° 18' E. Alternative sites

have been selected at Reinsdyrflýa, in lat. $79^{\circ} 41' N.$, long. $13^{\circ} 43' E.$, and Mosselbukta, in lat. $79^{\circ} 54' N.$, long. $16^{\circ} 04' E.$, in case ice prevents approach to Murchisonfjorden. The object of the expedition is to carry out investigations in meteorology and cosmic rays. A glaciological expedition, led by V. Schytt, will work in the neighbourhood during the summers of 1957 and 1958.

A Polish expedition to the Hornsund region of Vestspitsbergen, during which glaciological studies will be carried out in Van Keulenfjorden, Torell Land, Wedel Jarlsberg Land and Sørkapp Land.

A Canadian glaciological expedition to the Lake Hazen area of northern Ellesmere Island, 1957–58. The expedition, organized by the Arctic Division of the Defence Research Board, will be led by G. Hattersley-Smith.

DANISH GLACIOLOGICAL WORK IN GREENLAND, 1956

[Summarized from information supplied by Børge Fristrup.]

Preliminary studies in connexion with the Danish glaciological programme for the International Geophysical Year were carried out in west Greenland during the summer of 1956.

Jens Tyge Møller and Hans Graversen, surveyors, and Jens Fabricius, glaciologist, left Copenhagen on 25 May for Upernavik Ø, but were delayed by ice and did not reach the island until 20 June. A meteorological station was set up and normal synoptic observations carried out. A survey of the glacier was started and preparations made for measuring its rate of flow during the International Geophysical Year. The party left Upernavik Ø on 20 July.

Graversen and Fabricius, with two Greenlanders, then went on to Grædefjorden to set up a similar station at Alángordlia. However, Graversen's illness, an accident to one of the Greenlanders, and the deeply crevassed surface of the glacier caused them to abandon this project.

Børge Fristrup, who is in charge of the Danish glaciological programme for the International Geophysical Year, was also in west Greenland during the summer. He took part, as representative of the Ministeriet for Grønland, in the Snow, Ice and Permafrost Research Establishment programme, and carried out a reconnaissance by dog sledge in the Inglefield Bredning area before joining the party on Upernavik Ø. After leaving the island, he and Møller took part in the international glaciological course at Thule from 25 August to 15 September.

All the members of the party returned to Copenhagen at the end of September.

FRENCH EXPEDITION TO CENTRAL GREENLAND, 1956–57

[Summarized from information from Mme. S. Dumont.]

A French expedition, sponsored by Expéditions Polaires Françaises, left France in an aircraft of the Groupement des Moyens Militaires des Transports Aériens on 22 August 1956, to spend the winter season on the Greenland ice sheet. Members were:

Jean Dumont, Leader and glaciologist
M. de Lannurien, Meteorologist
P. Gennerseaus, Medical officer, physiologist
and psychologist
J. Diraison, Radio operator

The object of the expedition was to continue the observations begun in 1950–51,¹ and to demonstrate that a lightly equipped party could be carried rapidly to an inland station, winter there, and return to the coast on foot.

¹ *Polar Record*, Vol. 6, No. 46, 1953, p. 792–94 and Vol. 7, No. 48, 1954, p. 140–43.

Professeur R. Haefeli, President of the International Commission of Snow and Glaciers, and Dr L.-M. Carles accompanied the party as far as Keflavik, in Iceland. Commandant Mejin was in charge of the aircraft.

The party left Keflavik on 27 August, and were dropped by parachute on the Greenland ice sheet in about lat. $71^{\circ} 20' N.$, long. $33^{\circ} 55' W.$ In case weather conditions made continued supply impossible, everything necessary to support them for thirty days, together with radio and two sledges, was dropped on the one occasion. However, the weather continued to be favourable, and stores and equipment to last throughout the winter were dropped during eight flights in the following three weeks.

Stores and equipment were, as far as possible, packed in wooden boxes of 0.038 cu.m. (1.3 cu.ft.) capacity. These were then tied together into packages weighing 100 to 200 kg. (220 to 440 lb.) for parachute dropping. Men were dropped by parachute from a height of about 400 m. (1312 ft.), and stores from 250 m. (820 ft.). Free drops of supplies were made from a height of 5 to 10 m. (16.2 to 32.4 ft.). The drops were carried out with very little loss.

The hut was erected by 7 December; it is built of prefabricated panels consisting of an insulating material, "Dufaylite", between sheets of aluminium.

The results of the party's investigations will be correlated with those of the International Glaciological Expedition to Greenland, 1957-58.

The party expects to return on foot to the coast in June 1957.

OXFORD UNIVERSITY EXPEDITION TO WEST GREENLAND, 1956

[Summarized from information supplied by M. F. W. Holland. Reports on the Oxford University Expeditions to west Greenland, 1935, 1936 and 1938 appeared in the *Polar Record*, Vol. 2, No. 11, 1936, p. 38-39, No. 12, 1936, p. 138, No. 13, 1937, p. 32-35 and Vol. 3, No. 17, 1939, p. 31-32.]

A party from Oxford, London and Liverpool universities visited the south side of the Sukkertoppen ice cap in west Greenland during the summer of 1956. The object of the visit was to carry out glaciological and geomorphological studies in the area in continuation of work done by earlier expeditions. Members of the party were M. F. W. Holland, leader and geographer, I. C. Bennett, medical officer and assistant, I. O. M. Morin, zoologist, Miss G. R. Sutton, surveyor, and Miss D. Morin, assistant.

The party reached Godthaab on 20 July and went on by the police vessel *Elh Knudsen* on the 24th. A camp was set up near the snout of Tâterât sermiat, a glacier at the head of Evighedsfjorden, and an advance camp on Tâterât sermiat itself a few days later. On 7 August a way was found up a tributary glacier, on the south side of Mt. Atter. The party camped there from 12 to 26 August, climbed Mt. Atter, and carried out the major part of its programme. On 31 August Bennett, Holland and Miss Sutton sledged up Tâterât sermiat; the route, which had not been previously attempted, is not recommended.

The party left Evighedsfjorden on 16 September by fishing boat.

NOTES

CHANGES IN GREENLAND CONSTITUTION, 1947-55

A Greenland Commission was set up in November 1948 to study all aspects of Greenland life in order to make recommendations for the development of the country. The commission's report was presented in February 1950, and legislation was soon after introduced in the Danish rigsdag to implement certain constitutional changes which had been recommended.

Greenland was divided into three provinces,¹ Vestgrønland, Nordgrønland and Østgrønland, in place of the previous division into Sydgrønland, Nordgrønland and Østgrønland. The southern boundary of Vestgrønland is Lindénows Fjord and the northern is lat. 75° N.; the boundary between Østgrønland and Nordgrønland remains at Nordostrundingen.²

The province of Vestgrønland contains most of the population of Greenland. A landsråd [Provincial Council] and sixteen kommunalbestyrelser [Communal Councils] were set up in place of the old system of two landsråd, thirteen sysselråd [District Councils], and sixty-six kommuneråd [Communal Councils]. There is universal suffrage for all residents in Greenland over the age of twenty-three, and all voters are eligible for election to both types of council.

The landsråd consists of not more than fourteen members, elected for four years by popular vote; members of this council were formerly elected by the lower councils. The chairman is the landshøvding [Governor] of Greenland, whose post replaces that of the former two landsfogeder [Chief Administrators]. The landsråd meets once a year and is largely a consultative and advisory body. It submits proposals, however, including proposals for appropriations in the Danish budget, to the minister responsible for Greenland affairs.¹ It also obtains revenue from an import duty imposed on certain luxury goods.³ It controls its own expenditure, and the budgets of the kommunalbestyrelser.

Each kommunalbestyrelse consists of three to seven members, elected for four years. Councils elect their own chairmen and may co-opt expert assistance. The Danish government may appoint officials, kæmnere and komunefogeder, to assist the councils in their executive and administrative duties. These officials largely take the place of the kolonibestyrere, or factors, of the government trading concern, Den kgl. grønlandske Handel, who used to represent the administration in settlements. The kommunalbestyrelser administer social welfare and public services, such as road upkeep and sanitation, by means of grants from the landsråd.

Elections to both landsråd and kommunalbestyrelser were held in June 1950 and the landsråd met in September. An executive committee was elected and representatives chosen to sit on the board of Den kgl. grønlandske Handel, pris- og lønnævnet [Prices and Wages Board] and other public bodies.

Rigsdagens grønlandsudvalg [the Permanent Parliamentary Committee for Greenland] was re-organized to include two members chosen by the landsråd,

in addition to the eight elected by the Danish rigsdag. Elections to this committee were to follow all rigsdag and landsråd elections.

Other important changes in the administration of the country followed from the passing of a number of laws in May 1950. The control of education was removed from the church authorities, and came under a board of which the landshøvding is chairman; a skoledirektør [Director of Education] was appointed. The post of landslæge [Director of Medical Services] was created to supervise the health services. Den kgl. grønlandske Handel was separated from the administration of the country. The following year the judiciary was separated from the administration.⁴

In June 1950 the central Greenland administration in Copenhagen became a department within the office of the Prime Minister, and changed its name from Grønlands styrelse to Statsministeriets 2. departement (grønlands departementet).⁵

In Østgrønland and Nordgrønland, owing to sparseness of population administration remained the direct concern of the Prime Minister's office.

Then, in June 1953, the new Danish constitution⁶ was established, and further important changes took place. Greenland was given equal status with Denmark, and amongst the 179 members of the Danish folketing are two elected from Greenland. Greenlanders have similar electoral rights to those of the Danes. The island is divided into two constituencies by the boundary between the kommuner of Sukkertoppen and Holsteinsborg. Nordgrønland is in the northern constituency, and Østgrønland in the southern.⁷ The first elections under the new constitution were held in August 1953; Frederik Lyngé, a former trading agent, and Augo Lyngé, a training college teacher, were elected. Owing to practical difficulties the inhabitants of Nordgrønland and Østgrønland did not take part in the elections. Greenland representation on the Danish folketing's Greenland committee was altered to consist of the two Greenland members of parliament.⁸

The advance of Greenland from a colony to a self-governing province of Denmark was recognized by the General Assembly of the United Nations in November 1954. Augo and Frederik Lyngé were both present to confirm the Greenlanders' full satisfaction with the situation.

In September 1955 responsibility for Greenland administration was transferred from the Prime Minister's office to that of the minister of housing Johannes Kjærbo. The name of the department became Ministeriet for Grønland,⁹ and Eske Brun retained his post and title as Departementschef.

A committee was set up in the same year to study the results of the recent constitutional and social changes in Greenland; no report has yet been made.

References

¹ *Kundgørelser vedrørende Grønland* [issued by Ministeriet for Grønland, København] Afsnit 2, Gruppe 1, Lb. Nr. 1.

² *Kundgørelser* . . . , Afsnit 2, Gruppe 4, Lb. Nr. 1.

³ Imposed, mainly on spirits and tobacco, on 8 March 1951. *Kundgørelser* . . . , Afsnit 1, Gruppe 2, Nr. 1.

⁴ *Kundgørelser* . . . , Afsnit 7, Gruppe 1, Lb. Nr. 1.

⁵ *Kundgørelser* . . . , Nr. 7, [section] 283.

⁶ *Danmarks Riges Grundlov af 5 juni 1953*, [København], Statsministeriet, [1953].

⁷ *Kundgørelser...*, Afsnit 2, Gruppe 5, Lb. Nr. 2.

⁸ 24 October 1953. *Kundgørelser...*, Afsnit 2, Gruppe 3, Lb. Nr. 1.

⁹ *Kundgørelser...*, Afsnit 2, Gruppe 1, Lb. Nr. 4.

NORWEGIAN ARCTIC WEATHER STATIONS IN 1956

The weather station on Jan Mayen was re-established in 1941. This station is not only an important part of the Arctic weather observation network, but also an essential link between Norway and its sealing fleets in Vesterisen and Newfoundland waters. The weather stations on Bjørnøya (where there had been one before the war) and Hopen began operating in 1945, and those at Isfjord Radio and Myggbukta were re-established in 1946. From August 1945



○, Norwegian Arctic weather stations in 1956.

to July 1946 a station was operated at Longyearbyen as a substitute for Isfjord Radio. In 1950 the mining company Kingsbay Kullkompagni A/S established a weather station at Ny Ålesund, but this was closed down in 1953. All the five stations operating in 1956 made regular synoptic observations.

The stations at Hopen, Bjørnøya and Jan Mayen are operated by Vervarslinga for Nord-Norge, the north Norwegian weather service whose headquarters are at Tromsø. The Isfjord Radio weather station is maintained by the Norwegian telegraph office (Telegrafverket) and sends its reports to

Vervarslinga for Nord-Norge via Bjørnøya Radio. Myggbukta, the only Norwegian weather station in Greenland, is maintained by the trapping company Arktisk Næringsdrift A/S, under the supervision of Norsk Polarinstitutt who send an annual relief expedition, usually in the sealer *Polarbjørn* under John Gæver.

The weather station network in the Svalbard, Jan Mayen and east Greenland area is completed by the Danish stations in Greenland and two Soviet stations in Vestspitsbergen.

When large parts of Finnmark and Troms were laid waste, and their populations deported, during the German retreat in the last phase of the war, all contact was lost with meteorological stations north of Tromsø; nevertheless about thirty fully equipped weather stations were operating in Norway north of the Arctic Circle by the end of 1945. The number of weather stations in this region for which data are given in *Norsk Meteorologisk Årbok* (see below) increased between 1943 and 1955 from 28 to 39, while the World Meteorological Organization (*Weather reports, stations, codes and transmissions. Vol. A nomenclature of stations.* WMO-No. 9, TP 4. Suppl. 9, June 1956) lists fifty-five stations "actually in operation and used for synoptic purposes" in June 1956. There are also about fifty other stations at which precipitation only is measured.

The only Norwegian radiosonde stations in the Arctic are at Jan Mayen and Skattøra, near Tromsø.

Publications

Det Norske Meteorologiske Institutt, Oslo, issues, or provides the material for, several periodical publications:

Norsk Meteorologisk Årbok. Before 1945 this annual publication was called *Jahrbuch des Norwegischen Meteorologischen Instituts*. It presents the year's observational data for about 150 or 160 Norwegian weather stations, including those in Svalbard, Jan Mayen and east Greenland. The introduction is written in Norwegian and English, and there is an English key to the tables.

Oversikt over luftens temperatur, og nedbøren i Norge. This survey of air temperature and precipitation in Norway is published as supplement "P" to *Landbruksdirektørens årsmelding* [Annual report of the Director of Agriculture].

Årsberetning for budsjettåret...for de meteorologiske institusjoner i Norge [Annual report for each budget year on the meteorological institutions of Norway].

Kart over snøakkumulering i Norge (utgitt av Det Norske Meteorologiske Institutt) pr. 31/1, 28/2, 31/3 og 30/4, 19...i prosent av normalen (normalperiode 1901-1930) [Map of snow accumulation in Norway (published by Det Norske Meteorologiske Institutt) on 31/1, 28/2, 31/3 and 30/4, 19... as percentage of normal accumulation (base period 1901-30)].

Meteorologiske Annaler. This is a serial publication consisting of monographs on meteorological subjects published at irregular intervals since 1942.

ARKTISK INSTITUT, DENMARK

The Danish Arctic institute, Arktisk Institut, whose statutes were published in the *Polar Record*, Vol. 7, No. 49, 1955, p. 327-29, began to operate on 1 October 1954 under the direction of Helge Larsen. It is housed in a villa in Charlottenlund, a pleasant suburb of north Copenhagen. The address is Kraemer Hus, L. E. Bruunsvej 10, Charlottenlund. The institute's board of directors consists of Ejnar Mikkelsen (chairman), Eske Brun, Paul M. Hansen, Eigil Knuth, Helge Larsen and Arne Noe-Nygaard. The Arktisk Instituts Råd [advisory council] first met on 12 May 1955, when viceadmiral A. H. Vedel was chosen president.

Arktisk Institut is maintained partly by endowment (Skibsreder C. Kraemer og Hustrus Grønlandsfond), partly by government grant and by private subscription. Its annual income is about 40,000 kroner (approx. £2000).

The core of the institute's library is formed of books transferred from Grønlandsdepartementet (Ministeriet for Grønland) and Det kongelige Bibliotek, and includes the material confiscated from the Arctic institute set up by the Germans in Copenhagen during the Second World War. A classification system has been worked out for the special use of Arktisk Institut by J. Prytz Johansen of Universitetsbiblioteket. It is divided into six sections: A, general and non-Arctic works; B, bibliography; C, Arctic and Greenland, in general; D, Arctic and Greenland, subject section; E, Arctic, regional section; F, biography and letters. S. A. Uhrenholt has been cataloguing the institute's library according to this system, and it is intended to apply it to relevant books in other Danish libraries in order to build up a central catalogue of Arctic publications available in Denmark. Bjarne Stocklund has been organizing the institute's growing collection of manuscripts, and good progress has been made in arranging the photographs and newspaper cuttings. The equipment transferred from Dansk Expeditionsfond is lent to expeditions.

Arktisk Institut issues an annual report on its activities and on Danish scientific work in Greenland. It also houses the offices of Det grønlandske Selskab and Kommissionen for videnskabelige Undersøgelser i Grønland, as well as serving as the "home address" of Universitetets arktiske Station at Godhavn, west Greenland.

THE NORTHERN SEA ROUTE IN 1956

[From information contained in *Vodnyy Transport* [Water Transport] from 20 March, 19 May, 26 and 28 July, 14 August, 11 and 18 September, 4, 18, and 20 October, 22 and 29 November 1956, and in *Lloyd's List*, 25 July-10 November 1956, *passim*.]

The season under review was the first of the new (sixth) Five Year Plan, and followed the 20th Congress of the Soviet Communist Party at which the Plan was approved. V. F. Burkhanov, head of the Chief Administration of the Northern Sea Route [Glavsevmorput'], outlined in March 1956 the main ways in which the Plan would affect the Northern Sea Route. Goods turnover was to be "increased" (with no figures given), both to and from points along the

Siberian coast and over the through route. Port facilities were to be improved at Igarka and Bukhta Provideniya, and a site for a new port reconnoitred at Yugorskiy Shar. Building and purchase of new ships, including an atomic icebreaker, was chiefly aimed at substantially lengthening the shipping season. No indication of the present level of attainment in any sphere was given.

Information on shipping movements during the season is far from complete and is derived from fragmentary announcements in the press. The following facts emerge.

Forty-seven Soviet ships are mentioned by name as taking part, with indication that more were in fact employed. Five of them were icebreakers: the pre-war *Lazar' Kaganovich*, *Anastas Mikoyan*, and *Vyacheslav Molotov* of the *Stalin*-class, the post-war Finnish-built *Kapitan Voronin* of the *Kapitan*-class, and the *Sibir'yakov*, which was the Finnish *Jääkarhu* until handed over to the U.S.S.R. in 1944.

Convoys were despatched from both ends of the route. Those from Vladivostok went to the ports of Chukotka, to the Kolyma and Lena, and to Ostrov Vrangelya, the first passing through Bering Strait towards the end of July. The three *Stalin*-class icebreakers all appear to have been engaged in these waters for most of the season. *Anastas Mikoyan* escorted two freighters to Ostrov Vrangelya, to which 2000 tons of stores were taken. The season in this sector of the Northern Sea Route ended on 20 October, when the last ship, *Lazar' Kaganovich*, passed through Bering Strait southwards.

Operations from the western end were on a much larger scale. Convoys started leaving Arkhangel'sk for Nar'yan-Mar, at the mouth of the Pechora, in early July. Coal was brought from here to Arkhangel'sk by a shuttle service of lighters, each taking about eleven days for the round trip. The season lasted for about four months. The main shipping lane of commercial importance in the whole Northern Sea Route area is that from the west to the Yenisey. The principal freight is timber from Igarka, and most of it is carried by non-Soviet ships to destinations outside the U.S.S.R. Soviet sources mention that Igarka loaded over seventy ships during the season; *Lloyd's List* names forty-four non-Soviet ships which called there, but it would be rash to deduce that twenty-six or more Soviet ships were involved, since *Lloyd's List* is generally incomplete. It is certain, however, that some Soviet ships did carry Igarka timber, some of it to Arkhangel'sk. The last ships left the Yenisey in the second half of October. Dudinka, a port on the Yenisey downstream from Igarka, is reported to have grown considerably and to have a quay capable of accommodating a number of ships. Expansion of Igarka is planned.

Convoys left the west for destinations beyond the Yenisey, but there is no specific information about them. A passenger service from Arkhangel'sk to various points along the Northern Sea Route was operated by two passenger steamers, *Kooperatsiya* and *Sestoret'sk*. The former reached Pevek, in the Eastern Siberian Sea, before returning to the west; she was the first passenger vessel to make this trip.

New river vessels used the Northern Sea Route to reach the area in which they were to work. Seven passenger river vessels, built in Eastern Germany,

were sent by this route to the Ob', Yenisey and Lena. There was also coastwise traffic by lighters and barges between the Lena and the Yana, and from the Yenisey to the Ob'.

Relief ships went as usual to Zemlya Frantsa-Iosifa, the last voyages taking place in the first half of October.

A number of ships were able to make two and even three round trips to points along the Northern Sea Route during the season. The ice was in general not favourable, however, and there was some damage to ships.

A NEW UNIVERSITY IN YAKUTSK

[From *Pravda*, 30 September and 7 October 1956.]

The Yakutsk State University [Yakutskiy Gosudarstvennyy Universitet] was opened on 29 September 1956. It accepted over 1200 students for its first term, the majority of them belonging to minority peoples (Yakuty, Evenki, Eveny). There are faculties of the humanities, technical sciences, natural sciences and agriculture. A medical faculty is planned. Special emphasis is placed on technical courses, for instance in engineering and mining, but Yakut studies also find a place. The university has developed out of the existing Pedagogical Institute [Pedagogicheskiy Institut], and its first rector is Professor A. Mordvinov.

EIGHTH MEETING OF THE INTERNATIONAL WHALING COMMISSION, 1956

[Summarized from *Norsk Hvalfangst-Tidende*, Årg. 45, Nr. 11, 1956, p. 605-07, and 622-24, and *Nature*, Vol. 178, No. 4530, 1956, p. 406. A report on the seventh meeting of the commission appeared in the *Polar Record*, Vol. 8, No. 52, 1956, p. 44-45.]

The eighth annual meeting of the International Whaling Commission was held in London from 16 to 20 July 1956. All seventeen contracting governments,¹ except Brazil, were represented. Dr G. J. Lienesch (Netherlands), chairman of the Commission, presided. Italy and Portugal were represented by observers, as were also the Food and Agriculture Organization of the United Nations Organization, the International Council for the Exploration of the Sea and the International Association of Whaling Companies.

According to the Bureau of International Whaling Statistics at Sandefjord, nineteen factory ships with 257 catchers took part in the 1955-56 Antarctic season. The total catch by floating factories increased from 2,061,789 barrels to 2,134,012 barrels, at 6 barrels to the ton. The average price of oil was £70 to £80 a ton.

It was recommended that the present quota of 15,000 Blue Whale Units should not be exceeded in future seasons, and that, for the 1956-57 season, it should be reduced to 14,500 Blue Whale Units. The opening date of the Sei and Fin Whale season was fixed at 7 January 1957, that of Blue Whales at 1 February, and the season for taking Humpback Whales between 1 and

¹ Australia, Canada, Denmark, France, Great Britain, Iceland, Japan, Mexico, the Netherlands, New Zealand, Norway, Panama, South Africa, Sweden, the U.S.S.R. and the United States.

4 February inclusive. It was recommended that the area for Humpback whaling should be restricted to between longs. 0° and 70° W. At present every factory ship is required to carry two inspectors who are generally of the same nationality as the ship. Following the seventh meeting of the Commission in 1955, the United States was asked to prepare a protocol amending the Convention to include a scheme for the appointment of independent observers in addition to national inspectors. It is hoped that the protocol can be brought into force in time for the Commission to take action under its provisions at its ninth meeting.

At the seventh meeting it was also recommended that a previously reserved area in the Pacific sector of the Antarctic (between longs. 70° and 160° W.) should be opened for three seasons for the taking of Baleen Whales. The catch results from this area during the 1955-56 season were 24.9 per cent of the total Antarctic catch; the average yield per unit was 135 barrels, compared with 121.6 barrels per unit for the whole Antarctic.

The sum of £500 was set aside for whale marking activities.

RECOVERY OF *JOPETER* IN THE GREENLAND SEA, 1956

[Summarized from information provided by R. N. Salvesen and the Director, Stavanger Museum.]

In the *Polar Record*, Vol. 8, No. 53, 1956, p. 179-80, a note was published of the loss of the *Jopeter* in the Greenland Sea on 13 September 1955. This obituary has had a happier sequel than most in the re-appearance of the vessel nearly year later, when she was sighted by aircraft of Lauge Koch's expedition to Greenland.

The *Melshorn* and *Selbarden* were despatched from Brandal on 12 August by Assuranseforeningen Ishavet of Ålesund to attempt salvage. *Jopeter* was discovered aground on a mudbank in Mountnorris Fjord, Traill Ø, and after being pumped out, was refloated without difficulty. Her cargo was transferred to *Selbarden* and she arrived in Ålesund on 25 August, towed by *Melshorn*.

Jopeter originally belonged to the firm A/S Havfiske and was called *Brategg*. She was used for an oceanographical expedition sponsored by Norske Hvalfangstselskapers Forbund [Federation of Norwegian Whaling Companies] in the South Atlantic and Southern Oceans in 1947-48 (*Polar Record*, Vol. 5 Nos. 37/38, 1949, p. 346).

THE *ESKIMO BULLETIN*

[Summarized from information supplied by the Director, Northern Administration Lands Branch, Department of Northern Affairs and National Resources, Canada.]

The *Eskimo Bulletin* is produced by the Northern Administration Lands Branch of the Canadian Department of Northern Affairs and National Resources, and is distributed to Canadian Eskimos and to teachers, missionaries

R.R.S. John Biscoe

Photograph by courtesy of Colonial Office





and R.C.M.P. detachments in areas in which Eskimos live in northern Canada. It is also given to each of the several hundred Eskimos receiving treatment in tuberculosis hospitals in southern Canada.

Each number appears in two separate versions, one in English in Roman letters, and the second in Eskimo in both Roman letters and syllabics. The syllabics are for the benefit of Eskimos living east of Cambridge Bay, in Victoria Island, who commonly read and write through this medium.

Each number comprises a single article of educative value, attractively illustrated by photographs or drawings. There are articles on such subjects as Eskimo handicrafts (sculpture), the working and care of engines for boats, vocabulary of words in every-day use and an appeal for conservation of caribou.

The bulletin was first published in May 1953 and has appeared at irregular intervals since, owing to shortage of staff.

VISIT OF THE DUKE OF EDINBURGH TO THE FALKLAND ISLANDS DEPENDENCIES AND GOUGH ISLAND, 1957

The Duke of Edinburgh spent four days visiting British stations in the Falkland Islands Dependencies during his return voyage from Australia in January 1957. Mr O. R. Arthur, governor of the Falkland Islands, and Sir Raymond Priestley, Acting Director of the Falkland Islands Dependencies Scientific Bureau, were members of the party.

On the morning of 2 January the royal yacht *Britannia* and H.M.S. *Protector* met the *John Biscoe* near the ice edge off the northern tip of Adelaide Island, and the Duke and his party transferred to the *John Biscoe*. *Britannia* and *Protector* steamed north, clear of the pack ice, to Port Lockroy. *John Biscoe* went on to the Loubet Coast, where the station in Lallemand Fjord (Base W) was visited. Unfortunately low clouds hid everything except the lower slopes of the mountains.

Next day was sunny with perfect visibility and magnificent views. *John Biscoe* reached the Argentine Islands in the early morning. After inspecting the station (Base F), the party sailed northwards through Lemaire Channel, one of the most spectacular passages in the world, and reached the south coast of Anvers Island early in the afternoon. The Duke visited the station there (Base N) and the party then went on to Wiencke Island, where they rejoined *Britannia* and *Protector*, and inspected the station at Port Lockroy (Base A), across Gerlache Strait. The three ships then sailed together up Neumayer Channel and to the Danco Coast station (Base O), where the Duke saw his fourth station in one day. The royal party transferred back to *Britannia* and sailed on to Deception Island that night.

Next morning, 4 January, a visit by helicopter to the great penguin rookery on the east coast of Deception Island had been planned. The weather, however,

Prince Philip and Sir Raymond Priestley at the Falkland Islands Dependencies Survey station on Anvers Island, Palmer Archipelago

was unsuitable so it was decided to visit the station at Admiralty Bay in the South Shetland Islands. Before leaving Deception Island the Duke visited the F.I.D.S. station there (Base B), and H.M.S. *Protector*, Captain J. V. Wilkins, which had escorted the royal yacht since 31 December 1956. The weather deteriorated during the day, but the party was able to spend some hours at Admiralty Bay (Base G) before sailing on to Port Stanley in the Falkland Islands.

At each base the Duke met the staff and inspected the huts, equipment, dogs and everything else that was to be seen. His visits gave immense pleasure to the men at the stations.

Britannia reached Port Stanley on 7 January and remained in the Falkland Islands for four days, enabling the Duke to see many aspects of life in the islands.

The party next visited South Georgia, calling at Leith Harbour and Grytviken on the 12th; the Duke made the journey between the two whaling stations in a whale catcher, which also took him to see the large colony of King Penguins in the Bay of Isles.

On 16 January the day was spent on Gough Island inspecting the South African Weather Bureau meteorological station, and exploring the island. The Weather Bureau has taken over the hut built by the Gough Island Scientific Survey, 1955-56, of which the Duke was Patron. In the evening *Britannia* sailed for Tristan da Cunha.

BRITISH OFFICIAL APPROVAL OF PLACE-NAMES IN THE FALKLAND ISLANDS DEPENDENCIES

The following Ordinance was enacted on 19 June 1956, and was published on 1 July 1956 in the *Falkland Islands Gazette*, Vol. 65, No. 9, p. 71:

"Assented to in Her Majesty's name this 19th day of June, 1956.

O. R. ARTHUR
Governor

[L.S.]
No. 1

195

Falkland Islands Dependencies

IN THE FIFTH YEAR OF THE REIGN OF HER MAJESTY QUEEN ELIZABETH II,
OSWALD RAYNOR ARTHUR, C.M.G., C.V.O., Governor

An Ordinance

TO declare the place-names in the Dependencies of the Colony of the Falkland Islands which are officially accepted and to provide for the declaration from time to time of new place-names.

ENACTED by the Governor of the Colony of the Falkland Islands and the Dependencies thereof as follows:

1. This Ordinance may be cited as the Place-names Ordinance, 1956.

2. (1) The Governor may by Proclamation under his hand declare and publish a list of the names of the various islands and lands constituting the Dependencies and of the coasts, peninsulas, capes, headlands, hills, mountains, peaks, plateaus, nunataks, glaciers, valleys, seas, straits, sounds, bays, inlets and other physical features thereof; and of the harbours and whaling stations therein, and may from time to time in like manner add to or alter such list.

(2) Every Proclamation made under subsection (1) of this section shall be published in the *Gazette*, and the list of place-names contained therein or appended thereto shall show such particulars of the geographical position of each item as the Governor shall think necessary.

3. No place-names other than those that have been declared and published in the manner provided by the last preceding section shall be officially accepted or recognised.

4. The Governor may make Regulations for carrying out the provisions of this Ordinance and in particular prescribing the manner in which recommendations may be made to the government for additions to or alterations in the list of place-names which is in force for the time being and the particulars which such recommendations shall contain.

Promulgated by the Governor on the 19th day of June, 1956.

A. G. DENTON-THOMPSON,
Colonial Secretary."

Under the terms of section 2 (1) of this Ordinance, a Proclamation was made on 4 September 1956, as follows:

"No. 2 PROCLAMATION 1956
Made under section 2 of the Place-names Ordinance, 1956.

IN THE NAME of Her Majesty ELIZABETH II, by the Grace of God of the United Kingdom of Great Britain and Northern Ireland and of Her other Realms and Territories Queen, Head of the Commonwealth, Defender of the Faith.

A. G. DENTON-THOMPSON—*By His Honour AUBREY GORDON DENTON-THOMPSON, Esquire, M.C., Officer Administering the Government of the Colony of the Falkland Islands and its Dependencies.*
[L.S.]

WHEREAS by subsection (1) of section 2 of the Place-names Ordinance, 1956, it is provided that the Governor may by Proclamation under his hand declare and publish a list of the names of various islands and lands constituting the Dependencies and of the coasts, peninsulas, capes, headlands, hills, mountains, peaks, plateaus, nunataks, glaciers, valleys, seas, straits, sounds, bays, inlets and other physical features thereof; and of the harbours and whaling stations therein:

AND WHEREAS it appears to the Officer Administering the Government expedient that such a list should be published:

NOW, THEREFORE, I, AUBREY GORDON DENTON-THOMPSON, Officer Administering the Government of the Colony of the Falkland Islands and its Dependencies, in exercise of the powers vested in me aforesaid, do hereby proclaim and declare the place-names in the Dependencies of the Colony of the Falkland Islands, listed in the *Gazetteer of the Falkland Islands Dependencies* published by the Foreign Office, London, on the 20th September, 1955, to be the accepted place-names for official use.

GOD SAVE THE QUEEN

Given under my hand and the Public Seal at Government House, Stanley, this 4th day of September, in the year of Our Lord One thousand Nine hundred and fifty-six.

By command of the Officer Administering the Government,
S. G. TREES,
Acting Colonial Secretary."

UNITED STATES GAZETTEER:
GEOGRAPHIC NAMES OF ANTARCTICA

In January 1956 an official United States gazetteer¹ of Antarctica was published. This provides an opportunity for assessing progress towards Anglo-American agreement on the names accepted for official use by the two countries within the boundaries of the Falkland Islands Dependencies. The American gazetteer contains 3434 decisions on names in the whole continent and off-lying islands. Of these 2102 (61 per cent) lie within the Falkland Islands Dependencies.

Unofficial co-operation between the Secretariat of the Antarctic Place-names Committee in the United Kingdom and the United States Advisory Committee on Antarctic Names has been continuous since 1948. Up to that time the work of the two Committees had been completely independent and the respective decisions reflected this situation. Discussion and exchange of information have since resulted in a wide measure of agreement. Comparison of official American and British decisions² shows that 89 per cent of the names in the British gazetteer have also been accepted both in form and definition in the American gazetteer. The British gazetteer contains 2156 names. Of these 1922 are accepted by the Americans; there are at present no American decisions on 184 of them (146 in South Georgia, where the new maps resulting from the South Georgia Survey are still in preparation); the American and British decisions differ on only fifty names; and there are 130 American names which have not yet been considered by the Antarctic Place-names Committee. With further discussion, it should be possible to reduce these differences substantially.

The total of fifty American names which differ from British names excludes thirty-one differences which result merely from American use of the spelling "harbor"; it includes forty-six differences in the names themselves, two differences in definition, and two differences in both name and definition.

Of the 130 American names which are not included in the British gazetteer, 104 have been "temporarily discarded" by the British. Most of these American names result from air reconnaissance and lie in regions where adequate maps are not yet available; it is hoped that it will prove possible to identify a large proportion of them as the British survey progresses.

Whilst a few particularly intractable difficulties remain, such as the long standing difference between "Graham Land" and "Palmer Peninsula", it is encouraging to record such notable progress. The policies of the two committees are steadily converging. It would be interesting if similar comparisons could be made with the other nations possessing Antarctic interests, but this cannot be attempted until each authority produces its own official gazetteer.

BRIAN ROBERTS

¹ *Gazetteer No. 14. Geographic names of Antarctica... Revised edition. Official standard names approved by the United States Board on Geographic Names.* Washington, prepared in the Office of Geography, Department of the Interior, January 1956.

² The British decisions are contained in *Gazetteer of the Falkland Islands Dependencies*. London, Foreign Office, 20 September 1955. See also p. 459.

RENEWAL OF TRIPARTITE ANTARCTIC NAVAL DECLARATIONS FOR THE SEASON 1956-57

[Previous declarations were recorded in the *Polar Record*, Vol. 5, Nos. 37/38, 1949, p. 361; No. 40, 1950, p. 635; Vol. 6, No. 42, 1951, p. 277; No. 44, 1952, p. 349; No. 46, 1953, p. 838; Vol. 7, No. 48, 1954, p. 266; No. 50, 1955, p. 425 and Vol. 8, No. 53, 1956, p. 181.]

Since January 1949 the United Kingdom, Argentina and Chile have annually informed each other that, apart from customary movements, they could foresee no need to send warships south of lat. 60° S. The object has been to avoid friction in Antarctica between the three powers. These declarations were renewed for the 1956-57 southern season on 23 November 1956.

CHILEAN LAWS RELATING TO THE ANTARCTIC, 1955 AND 1956

[The texts of earlier Chilean laws were published in the *Polar Record*, Vol. 4, No. 32, 1946, p. 416-17; Vol. 5, Nos. 35/36, 1948, p. 225-27; and Vol. 5, No. 39, 1950, p. 481-82. Chilean Decree No. 1747, of the Ministerio de Relaciones Exteriores, fixing Chilean territorial claims in the Antarctic, although signed by the President on 6 November 1940, was not published in the *Diario Oficial de la Republica de Chile* until 21 June 1955. This was also the date of publication in the *Diario Oficial* of Law No. 11,846 of the Ministerio del Interior, which placed the Antarctic territories claimed by Chile under the administration of the Governor of the province of Magallanes. This law provided that the Governor would exercise his functions in accordance with an "Antarctic Statute" to be published subsequently. The "Statute" was issued as Decree No. 298 of the Ministerio de Relaciones Exteriores, signed by the President on 17 July 1956. It came into force on the day of its publication in the *Diario Oficial*, 3 October 1956. It is curious that the text of Decree No. 1747 contains no reference to the date on which it was to come into effect. The text was published in the *Polar Record*, Vol. 4, No. 32, 1946, p. 416-17, and is therefore not repeated here. The other two texts are printed below.]

Translation:

Chilean Law No. 11,846 of 21 June 1955

"WHEREAS the National Congress has given its approval to the following

Draft law:

Article 1. The Governor of Magallanes, within his legal powers, shall be informed of and settle all administrative matters in connection with the Territorio Antártico Chileno [Chilean Antarctic Territory], the limits of which were fixed by Supreme Decree No. 1747 of 6 November 1940, without prejudice to the arrangements specified in the following Article.

Article 2. Owing to the special nature of the Chilean Antarctic Territory, it shall in practice be administered under a special régime which will be established by a Chilean Antarctic Territory Statute.

Article 3. The Statute of the Chilean Antarctic Territory will be drawn up by the President of the Republic, advised by his Ministers of the Interior, Relaciones Exteriores, Defensa Nacional, and Tierras y Colonización, subject to the prior reports of the Consejo de Defensa Fiscal [Council of Government Defence] and the Comisión Antártica Chilena [Chilean Antarctic Commission].

And whereas I have approved and sanctioned this, let it therefore be promulgated and carried into effect as a Law of the Republic.

Santiago, 17 June 1955

[Signed] CARLOS IBAÑEZ DEL CAMPO
Osvaldo Koch, as Minister of the
Interior and acting Minister of
Foreign Affairs."

*Translation:**Chilean "Antarctic Statute", Decree No. 298 of 17 July 1956*

"WHEREAS Law No. 11,846 of 17 June 1955 in its Article 2 stipulated that 'in view of the special nature of the Chilean Antarctic Territory, it shall in practice be administered under a special régime which will be established by a Chilean Antarctic Territory Statute' and, in its Article 3, that such Statute 'will be drawn up by the President of the Republic, advised by his Ministers of the Interior, Relaciones Exteriores, Defensa Nacional, and Tierras y Colonización, subject to the prior reports of the Council of Government Defence and the Chilean Antarctic Commission';

AND WHEREAS by Supreme Decree No. 1723 of 2 November 1940, the Ministerio de Relaciones Exteriores was given exclusive responsibility for 'taking note of and settling all matters of whatever nature relative to the Chilean Antarctic';

AND WHEREAS Supreme Decree No. 454 of 8 September 1953 laid down, in its Article 1, that it is the responsibility of the Departamento de Tratados y Límites de la Dirección Política del Ministerio de la Relaciones Exteriores 'especially to attend to problems relating to Chilean sovereignty in the Antarctic Territory',

I HEREBY DECREE

Article 1. It will fall on the Governor of Magallanes to take note of and settle all administrative affairs connected with the Chilean Antarctic.

Article 2. The Governor of Magallanes, in exercising his functions and in accordance with the nature of the case, will consult the highest-ranking officer in the Army, Navy or Air Force, resident in Punta Arenas.

Article 3. The decisions taken by the Governor of Magallanes in connection with the Chilean Antarctic must be upon a proper legal basis and made in writing. He personally should send copies of them as soon as issued to the Ministerios del Interior, Relaciones Exteriores, Defensa Nacional, and Tierras y Colonización for corresponding action.

Article 4. The Governor of Magallanes should report annually and in full detail on all his activities in connection with the present Statute to the Ministerio del Interior which will circulate copies of his report to the Ministerios del Relaciones Exteriores, Defensa Nacional and Tierras y Colonización.

Article 5. The Governor of Magallanes will designate the highest ranking officer at the permanent Antarctic bases to be his representative in the Chilean Antarctic. He will make this designation after prior consultation with the Ministerio de Defensa Nacional. This representative will carry out the orders and instructions which the Governor may give him and will be responsible to the latter for their proper fulfilment. If the representative of the Governor should be unable for any reason to perform his functions, his post will be taken over meanwhile by the next highest ranking officer at the permanent bases.

Article 6. The representative of the Governor of Magallanes will be authorised to certify the civil status of persons and to inscribe them in a special register which will be kept for this purpose, with the obligation of communicating its entries annually to the Officer of the Civil Register in Punta Arenas who will make out the corresponding inscription in accordance with standing legal dispositions. This communication will be passed through the Governor.

Article 7. This representative may also receive and authorise wills, observing the following regulations:

- (a) In case of imminent danger, a verbal testament may be made in accordance with Articles 1031, 1032, 1033, 1034, 1035 and 1036 of the Civil Code; th

information referred to in Articles 1037 and 1038 of that Code should be given to the representative of the Governor who will forward it to the *Juzgado de Letres* of Punta Arenas.

- (b) An open will is to be received by the representative of the Governor in the presence of three witnesses. If the witness does not know how to write or is incapacitated from doing so, this fact will be stated in the will. A duplicate of the will is to be made out with the same signatures as the original and is to be forwarded to the Notary Public of Punta Arenas for registration. The making of an open will is to be recorded in a special register to be kept at the Antarctic base.
- (c) If it is preferred to make a sealed will, the formalities outlined in Article 1023 of the Civil Code will be observed, the representative of the Governor acting as competent Judge [*Ministro de Fe*]; this latter will forward a copy to the Notary Public of Punta Arenas for registration. The representative of the Governor, in turn, may delegate to the heads of other permanent Antarctic bases the responsibilities which he is given by this and the preceding article. All communications referred to in this article will be passed through the Governor.

Article 8. A postal and telegraphic agency will be established at each of the permanent Antarctic bases which will be supervised by the leader of the base without payment.

Article 9. The Governor of Magallanes will pay special attention to the supervision and control of fishing and hunting in the Chilean Antarctic. In applying this function, it will be his exclusive duty, in accordance with current national legislation:

- (a) to grant temporary entry and exit permits to national and foreign fishing vessels;
- (b) to authorise temporary fishing activities in the area of his jurisdiction, and
- (c) to apply the corresponding control in the case of contravention of the standing regulations.

All measures taken by the Governor under the terms of this article are to be communicated immediately to the corresponding *Gobernación Marítima* [Maritime Authority], to the *Dirección General de Pesca y Caza* [Directorate of Hunting and Fisheries] or to the relevant competent authority.

Article 10. The taxes collected for fishing and hunting, and the corresponding fines, will be deposited in the Fiscal Treasury of Punta Arenas in a special account to be opened in accordance with the instructions of the Comptroller General of the Republic.

Article 11. Concessions of islands or any part of the Chilean Antarctic Territory will be granted by the President of the Republic through the intermediary of the *Ministerio de Tierras y Colonización* after prior consultation with the Governor of Magallanes, to Chilean nationals or Chilean companies formed exclusively of Chilean subjects, only for purposes of exploitation and not outright and in no case for periods exceeding five years, renewable for similar periods. The concessionaires will be exempt from the payment of land taxes. If, at the termination of the concession, be this due to the expiry of its period, to its being declared void by a competent administrative authority, or for any other legal reason, the holders should refuse to hand over the land, upon request, to the government, the President of the Republic may order immediate surrender of the property, without legal proceedings and with the aid of public forces should this prove necessary.

The preceding clause will also be applied in those cases where lands are occupied by persons without title to them.

Article 12. Transfers of such concessions are to be approved by the President of the Republic in accordance with the first paragraph of the preceding article, but in no case for a longer period than the unexpired part of the original concession.

In cases covered by this and the preceding article, the relevant Supreme Decree is to be legalised as a public document before the Notary Public of Punta Arenas and inscribed with the Conservador de Bienes Raíces [Curator of Property] of Magallanes.

Article 13. In the case of capture of shipping, the relevant lawsuit will be heard before the Civil Court of Punta Arenas in the first instance and before the Court of Appeals at Valdivia on second hearing.

As far as contraventions of aerial navigation are concerned, the Aviation Authority created by Law No. 7852 of 27 October 1954 will be competent to deal therewith, together with the 'Fiscalía' of the Fourth Air Zone, with headquarters in Punta Arenas.

Article 14. It will fall to the Civil Court of Punta Arenas, in the first instance, to try and pass sentence upon all civil or criminal cases, whether voluntary or disputed, which may occur in the Chilean Antarctic. In the second instance, the Court of Appeals at Valdivia will be the competent body.

Hearing of military cases will fall to the competent military courts.

Article 15. Without prejudice to the dispositions of the present Statute, the Ministerio de Relaciones Exteriores will supervise and co-ordinate all matters relating to the Chilean Antarctic and will act through the ministries concerned.

Article 16. In all cases not covered by this Statute, the laws and general regulations in force in the Republic will apply.

Article 17. The present Statute will come into effect as from the date of its publication in the *Diario Oficial*.

Temporary Article. The Director of National Property of the Ministerio de Tierras y Colonización will inscribe as national property in the Register of the Curator of Property of Magallanes, the territory situated within the limits defined by Supreme Decree No. 1747 of 6 November 1940 of the Ministerio de Relaciones Exteriores.

To be noted, registered, made known, published and inserted in the Compilation of Laws and Decrees of the *Contraloría General* of the Republic.

Santiago, 17 July 1956

[Signed] C. IBAÑEZ C.

Benjamin Videla

Oswaldo Sainte-Marie

Francisco O'Ryan

Santiago Wilson"

OBITUARY

BJARNE AAGAARD was born at Sandefjord, Norway, in 1873, and died on 29 September 1956. Aagaard went to sea at the age of fifteen, and visited North and South America before entering a shipping office in Glasgow. By 1892 he had become manager of the firm's branch in Greenock. In 1893 he moved to Hamburg, where, in 1898, he started his own shipping office. In 1900 Aagaard undertook all chartering and clearance of ships which were to carry ten million tons of iron ore from Narvik and Luleå to the Continent and the United Kingdom during the period 1903-13. Meanwhile, he wrote numerous articles on shipping for the Norwegian, English and German press, and attracted attention by his publications on economic subjects. At the request of Norwegian shipping lines, Aagaard established a successful firm in Hong Kong (1904), with branches in Kobe and Yokohama (1905). He travelled widely in the East. He returned to Norway in 1909, but in 1911-12 travelled extensively in South America to study trade and shipping conditions. Aagaard then established a company to exploit mineral springs at Larvik (1914); he was a member of the board of directors of various other companies, and in 1920 became Swedish Consul at Larvik. From 1922 to 1925 he was managing director and chairman of the board of Farris Ltd. and of Angus Railway Control Co. Ltd., London.

In 1925 Aagaard retired, settled down at Stavern in Norway, and devoted himself entirely to letters. He is best known for his work on Antarctic history and whaling, and for his energetic defence, by means of innumerable press articles and direct persuasion of the authorities, of Norwegian interests in that area. In 1926 he began his monumental *Fangst og forskning i Sydishavet* [*Hunting and exploration in the Southern Ocean*]. The Norwegian annexation of Bouvetøya in 1927 was largely due to information and stimulus provided by Aagaard. In the same year he began his sustained agitation for the restriction of whaling in the Antarctic in order to preserve the stock, and for many years he worked hard for the Norwegian annexation of Dronning Maud Land, which finally took place in 1939.

Aagaard published numerous books and articles, including *Den gamle hvalfangst: kapitler av dens historie* (Oslo, Gyndendal, 1933) and "Den gamle hvalfangst: kapitler av dens historie 1767-1886" (*Norges Svalbard- og Ishavs-undersøkelser. Meddelelser*, Nr. 61, 1944); "Who discovered Antarctica?" (*Proceedings of the Sixth Pacific Science Congress*, 1939, Vol. 2, 1940); "Antarktis 1502-1944: oppdagelser, naturforhold og suverenitetsforhold" and "Oppdagelser i Sydishavet fra middelalderen til Sydpolens erobring" (*Norges Svalbard- og Ishavs-undersøkelser. Meddelelser*, Nr. 60, 1944, and Nr. 62, 1946).

Fangst og forskning i Sydishavet remains, however, Aagaard's most important work. The four volumes were published between 1930 and 1950. In all, the volumes contain about 2500 pages. It is a scholarly work, containing a bibliography of about 8000 entries, and is obviously the result of infinite labour. Although it is the ultimate authority to which one turns on many subjects, when all other sources have failed, it stands as a warning against bad arrangement. A confusion of volumes, repetition, overlapping, and a plurality of indexes makes the work one of the most inconvenient that it can be the lot of a historian to handle. Yet all this does not prevent it being an impressive monument to the author's enthusiasm, dedication and energy.

Aagaard left to Kommandør Chr. Christensens Hvalfangstmuseum his Antarctic collection, which included, apart from books and periodicals, some 50,000 chronologically arranged and indexed press cuttings, 600 maps, 3000 photographs and pictures, and many manuscripts and letters.

OVE BALTHASAR BØGGILD, the Danish authority on Greenland mineralogy, was born in 1872 and died on 13 November 1956. He carried out mineralogical investigations on the bottom samples from the Arctic Ocean brought back by the *Ingolf* in 1896. From 1912 to 1942 he was professor of mineralogy at Københavns Universitet. Bøggild first visited Greenland in 1900, when he accompanied Professor N. V. Ussing to the Julianehåb and Frederikshåb areas. A series of treatises on Greenland minerals followed, culminating in 1905 in his "Mineralogia Groenlandica" (*Meddelelser om Grønland*, Bd. 32). A new, greatly enlarged edition of this work appeared in English in 1953 (*Meddelelser om Grønland*, Bd. 143). From 1913 to 1953 Bøggild was a member of Kommissionen for videnskabelige Undersøgelser i Grønland and of the editorial committee of *Meddelelser om Grønland*. In 1952, on his eightieth birthday, a newly discovered mineral from Ivigtut was called after him, "bøggildite".

VICTOR LINDSEY ARBUTHNOT CAMPBELL, D.S.O., O.B.E., R.N. (Retd.) was born in 1875 and died in Newfoundland on 19 November 1956. He was First Officer on the *Terra Nova* during the British Antarctic Expedition, 1910-13. He was in command of the Northern Party which left Cape Evans on 25 January 1911 to carry out the exploration of the coast west and south of Cape Adare. The party was to have been brought back by ship to the main base before the winter of 1912 set in, but gales and ice prevented the ship from reaching them. Campbell, with Murray Levick, Priestley, Abbott, Browning and Dickason, spent the seven winter months in a small ice cave on very short rations. On 30 September 1912 they set out on the 200-mile sledge journey to Cape Evans, arriving there on 7 November. He was promoted to the rank of Commander for his part in the expedition. During the 1914-18 war he fought in the Dardanelles. He lived in Newfoundland since 1922.

Frank Debenham writes of him:

"As 'Number One' on the *Terra Nova* Campbell was an instance of that rarity, an officer who could be a martinet on deck and a good companion on his watch below. There you could call him 'The Wicked Mate' to his face, or see him joining in most of the ward-room rags, but on deck you learned to jump to his bidding as if he had a rope's end in his hand. He was naturally somewhat quiet and reserved with a low voice which he could, nevertheless, raise to the most penetrating rasp, audible in a gale of wind from the poop all over the ship's deck. His love of routine and orderliness had a rude surprise when he found himself in command of five others living in the cold and grimy darkness of an ice cave for an Antarctic winter, but we are told that even there every piece of blubber or tag end of greasy rag had its proper place. It must have been martyrdom to a man who put cleanliness on a level with godliness. Ashore he was the most gentle, courteous quiet speaker and even on duty he could be so, until you dropped some tar on his lily white decks, or failed to recognize the correct halliard. His feat of bringing his party through the cold and famine of that wintering was one which deserved more credit than it ever received, being rather overshadowed by the tragic end of Captain Scott and his companions."

GERALD STOKELY DOORLY was born in Trinidad on 4 June 1880, and died in New Zealand on 3 November 1956. He served as third officer on the *Morning* during her two voyages as relief ship to the British National Antarctic (*Discovery*) Expedition, 1901-03. He emigrated to New Zealand in 1905 and remained there until the time of his death.

ROBERT NEAL RUDMOSE-BROWN was born in London in 1879 and died at Sheffield on 27 January 1957. His father was Dr Robert Brown of Campster, who was responsible for the geography section in the collection of Arctic Papers prepared by the

Royal Geographical Society for the Expedition of 1875. Rudmose-Brown was educated at Dulwich College and at Aberdeen University, and later at Montpellier. He was Assistant Professor of Botany at University College, Dundee, from 1900 to 1902. In 1908 he was appointed Lecturer in Geography at Sheffield University and became Professor of Geography there in 1931. He was also Reader in Geography at Manchester from 1920 to 1922. He retired in 1945, when he was made Emeritus Professor.

In the Antarctic, Rudmose-Brown was botanist on the *Scotia* during the Scottish National Antarctic Expedition of 1902-04, which wintered in the South Orkney Islands and discovered Coats Land. On returning home, he became assistant to Dr W. S. Bruce in the Scottish Oceanographical Laboratory in Edinburgh from 1904 to 1905.

In the Arctic, he made his first expedition with Dr W. S. Bruce to Prins Karls Forland and Spitsbergen. He worked as naturalist and surveyor there over a long period of years, in 1914, 1919, 1920, 1922, 1924 and 1925, and on most of these occasions was consultant to the Scottish Spitsbergen Syndicate.

Among other activities Rudmose-Brown reported on the oyster pearl fisheries of Lower Burma to the Indian Government. During the First World War he worked in the Intelligence Department of the Naval Staff in London and was largely responsible for Arctic information. This was followed up when he became a member of the Naval Intelligence Division during the Second World War. He collaborated in the compilation of Spitsbergen information and this and his previous work was recognized by his being made Commander of the Order of St Olav by the Norwegian Government. Further honours which came to him were Vice-President of the International Polar Congress in 1906, and President of the Institute of British Geographers, 1937-38.

He was author of *The voyage of the Scotia* (Edinburgh and London, 1906), *Spitsbergen* (London, 1920), *A naturalist at the Poles: the life, work and voyages of Dr W. S. Bruce* (London, 1923), and *The polar regions: a physical and economic geography of the Arctic and the Antarctic* (London, 1927). He wrote many papers for periodicals and on his death bequeathed the main part of his library to the Scott Polar Research Institute.

Frank Debenham writes of him:

"Besides being familiar to the normal academic and geographical circles, his tall, almost gaunt, figure was well-known to polar men of several generations, when any gathering of them took place. His considerable knowledge of both polar regions was in request over the planning of expeditions. He was a grand companion in the field and a valued counsellor at the committee table, where his direct manner coupled with his eagle eyes and bushy eyebrows kept business on the move—he was much averse to any beating about the bush. As far as knowledge both of polar matters and polar men was concerned he was the natural successor to Dr Hugh Robert Mill. He must have been almost the last survivor of the *Scotia* expedition; and the Antarctic Club, of which he was President in 1932, will miss his commanding figure and modest mien as they know it when, year after year, he rose to the toast of that expedition at the annual dinner."

RECENT POLAR LITERATURE

This selected bibliography has been prepared by R. J. Adie, Terence Armstrong, T. H. Ellison, Amorey Gethin, J. W. Glen, W. B. Harland, H. G. R. King, Brian Roberts and Ann Savours. Its main field is the polar regions, but it also includes other related subjects such as "applied" glaciology (e.g. snow ploughs and ice engineering). For the literature on the scientific study of snow and ice and of their effects on the earth, readers should consult the bibliographies in each issue of the *Journal of Glaciology*. For Russian material, the system of transliteration used is that agreed by the U.S. Board on Geographic Names and the Permanent Committee on Geographical Names for British Official Use in 1947 (see *Polar Record* Vol. 6, No. 44, 1952, p. 546).

Reprints of "Recent Polar Literature", from Nos. 37/38 onwards, can be obtained separately (to allow references to be cut out for pasting on index cards) from the Institute price 2s. 6d. for two reprints. Copies will be sent without charge to organizations with which the Institute maintains exchange arrangements and which notify their wish to receive them. Readers can greatly assist by sending copies of their publications to the library of the Institute.

To increase the usefulness of the bibliography entries have been arranged provisionally under subject headings in classified order according to the Universal Decimal Classification. When circumstances permit the decimal notation will be included, together with a key.

INSTITUTIONS

- KUSUNOKI, KOU. Polar research organizations throughout the world. *Journal of the Japanese Society of Snow and Ice*, Vol. 17, No. 2, 1956, p. 22-25. [Research institutes, societies and journals in 16 countries listed. In Japanese.]
- [CANADIAN WILDLIFE SERVICE.] Notes on the northern activities of the Canadian Wildlife Service, 1954. *Arctic Circular*, Vol. 8, No. 2, 1955, p. 31-33.
- PENNIE, A. M. Defence Research Northern Laboratory. *Canadian Army Journal*, January 1956, 8 p. illus. (Reprint.) [Description of Canadian Defence Research Board station Churchill, by the Superintendent.]
- [SCOTT POLAR RESEARCH INSTITUTE.] *Scott Polar Research Institute. Third edition.* Cambridge [Scott Polar Research Institute], 1956. ii, 13 p. illus. 25½ cm. 2s. 9d. [Informative guide.]

RELIGION. THEOLOGY

- CARPENTER, EDMUND S. Changes in the Sedna myth among the Aivilik. *Anthropological Papers of the University of Alaska*, Vol. 3, No. 2, 1955, p. 69-73. [Effect of Christian beliefs on Eskimo idea of Sumna, mistress of nether world.]
- MARSH, GORDON H. A comparative study of Eskimo-Aleut religion. *Anthropological Papers of the University of Alaska*, Vol. 3, No. 1, 1954, p. 21-36. [Alaska. Concerns beliefs, no ritual.]

ETHNOGRAPHY. CUSTOMS. FOLKLORE

- CUMMING, JOHN R. Metaphysical implications of the folk-tales of the Eskimos of Alaska. *Anthropological Papers of the University of Alaska*, Vol. 3, No. 1, 1954, p. 37-63. [Cosmology; nature of man; spiritualism.]
- LANTIS, MARGARET. Nunivak Eskimo personality as revealed in the mythology. *Anthropological Papers of the University of Alaska*, Vol. 2, No. 1, 1953, p. 109-74. [Psychological and sociological analysis of myths.]
- HARRINGTON, RICHARD. Eskimos I have known. *Geographical Magazine*, Vol. 28, No. 8, 1955, p. 387-89, plates. [In Canadian Arctic during six winters.]
- HONIGMANN, IRMA, and HONIGMANN, JOHN. Child rearing patterns among the Great Whal River Eskimo. *Anthropological Papers of the University of Alaska*, Vol. 2, No. 1, 1953, p. 31-50. [South-east Hudson Bay. Authors' sociological studies, 1949-50.]
- LUCIER, CHARLES. Buckland Eskimo myths. *Anthropological Papers of the University of Alaska*, Vol. 2, No. 2, 1954, p. 215-33. [Stories related by Kangyikmiut of Alaska.]
- MUÑOZ, JUAN. Cliff dwellers of the Bering Sea. *National Geographic Magazine*, Vol. 102, No. 1, 1954, p. 129-46, illus., map. [Author's winter as school teacher, Alaska Native Service, to Eskimo on King Island, off Nome. Photographs.]

- ROUSSEAU, JACQUES. L'origine et l'évolution du mot esquimau. *Cahiers des Dix*, No. 20, 1955, p. 179-98. [Etymology.]
- WILKINSON, DOUG. *Land of the long day*. London, George G. Harrap, 1956. viii, 261 p. illus., maps (on end papers). 23½ cm. [Author's life with Eskimo of Baffin Island, 1951-53. Reviewed by P. P. Baird, *Arctic*, Vol. 8, No. 4, 1955, p. 252-53.]
- ALLEN, ROSEMARY A. Patterns of preferential marriage among the Alaskan Haidas. *Anthropological Papers of the University of Alaska*, Vol. 2, No. 2, 1954, p. 195-201. [Kinship studies.]
- MANKER, ERNST. *Les Lapons des montagnes suédoises*. 5e édition. Paris, Gallimard, 1954. 289 p. illus., maps, 23 cm. 1200 frs. (Géographie Humaine 24.) [French edition of *De svenska fjällapparna*, Stockholm, Svenska Turistföreningen, 1947. Bibliography.]
- MANKER, ERNST. Samernas trolltrummor. *Västerbotten*, Årg. 36, 1955, p. 16-29, illus. [Lapp magic drums.]
- NESHEIM, ASBJØRN. Nye veier for økonomisk, sosialt og kulturelt arbeid på samisk område. *Sameliv*, 1953-1955 (pub. 1955), p. 71-74. [Opening speech at Scandinavian conference on Lapp economic and cultural affairs, Jokkmokk, north Sweden, 1953.]
- NICKUL, KALLE. Det samiska samhället såsom jag lärde känna det hos suenjelskolterna. *Sameliv*, 1953-1955 (pub. 1955), p. 5-15, illus. [History and way of life of Suenjol Skolt Lapps, western Kol'skiy Poluostrov (Kola Peninsula).]
- PAVEL, HJALMAR. Jokkmokk-konferansen og det som har fulgt i dens spor. *Sameliv*, 1953-1955 (pub. 1955), p. 96-108, 139-43. [Problems discussed at Scandinavian conference on Lapp economic and cultural affairs at Jokkmokk, north Sweden, 1953 (text of resolution in Swedish and Lappish); subsequent developments.]
- WITH, THOR. En busstur og noen refleksjoner. *Sameliv*, 1953-1955 (pub. 1955), p. 135-38. [Problems of ignorance of Norwegian public about Lapp culture.]
- KEITHAHN, EDWARD L. Human hair as a decorative feature in Tlingit ceremonial paraphernalia. *Anthropological Papers of the University of Alaska*, Vol. 3, No. 1, 1954, p. 17-20.
- DOLGIKH, B. O. Etnograficheskiy sostav naseleniya Yakutskogo uyezda v XVII veke [Ethnographic composition of the population of Yakutskiy Uyezd in the 17th century]. *Akademiya Nauk SSSR. Institut Etnografii imeni N.N. Miklukho-Maklaya. Kratkiye Soobshcheniya* [Academy of Sciences of the U.S.S.R. N.N. Miklukho-Maklay Institute of Ethnography. Short Communications], No. 24, 1955, p. 30-50, maps. [Peoples of central Yakutiya, based on fur tax (*yasak*) returns.]

PHILOLOGY. LINGUISTICS

- THIBERT, ARTHUR. *Dictionnaire français-esquimau, esquimau-français*. Ottawa, University of Ottawa, 1955. 200 p. 21 cm.

GEODESY. SURVEYING

- NEY, C. H. Geographical positions from stellar azimuths. *Transactions American Geophysical Union*, Vol. 35, No. 3, 1954, p. 391-97. [Method developed of particular interest for use in high latitudes.]
- MARTIN, JEAN. *Étalonnage des gravimètres sur les bases pendulaires européennes*. Base française Paris-Toulouse. 2e édition. Paris, Expéditions Polaires Françaises, 1955. [ii], 127 p. illus. 26½ cm. (*Expéditions Polaires Françaises. Missions Paul-Emile Victor, résultats scientifiques*, No. NS. III. 3.) [Establishment of gravimetric base Paris-Toulouse in order to standardize observations in Greenland and Terre Adélie.]
- EINARSSON, TRAUSTI, and others. A report on the French-Icelandic gravity measurements in southern Iceland in 1950 by T. Einarsson, Th. Sigurgeirsson and G. Bödvarsson. *Vísindafélag Íslendinga*, 1951, p. 35-52, map.
- BULL, COLLIN B. B. Values of gravity on the inland ice in north Greenland. *Meddelelser om Grønland*, Bind 187, Nr. 1, 1955, 11 p. [Field work in 1952-54.]
- GREMMER, PAUL E. Arctic mapping—aerial photography. *Canadian Surveyor*, Vol. 11, No. 4, 1953, p. 31-32. [United States Air Force air photographic surveying in Alaska, 1941-53.]
- PATERSON, W. S. B. Altitudes on the inland ice in north Greenland. *Meddelelser om Grønland*, Bind 187, Nr. 1, 1955, 12 p. [Field work in 1952-54.]

NAVIGATION. NAUTICAL ASTRONOMY

- ROBERTSON, O. C. S. Sea navigation methods in northern Canada. *United States Naval Institute Proceedings*, Vol. 82, No. 8, 1956, p. 892-96, illus. [Practical problems and their solution.]

- [RADIO DIRECTION FINDING : BAFFIN ISLAND.] *Navigation. Loran station on Cape Christian Baffin Island. Agreement between the United States of America and Canada effected by exchange of notes signed at Ottawa May 1 and 3, 1954. Entered into force May 3, 1955.* Washington, D.C., United States Department of State, 1954. 5 p. (Treaties and other International Acts Series 8019.)

GEOPHYSICS

- FENTON, A. G., and others. Cosmic-ray increase observed at high southern latitudes on February 23, 1956, by A. G. Fenton, K. G. McCracken, N. R. Parsons and P. A. Trosch. *Nature*, Vol. 177, 1956, p. 1173-74. [Observations at Macquarie Island and Mawson.]
- PANASENKO, G. D. Zemletryaseniye v Khibinakh [Earthquake at Khibiny]. *Priroda* [Nature], 1956, No. 7, p. 110-11. [Recorded 8 August 1955.]

GENERAL GEOLOGY

(See also Stratigraphy, Petrology, Economic Geology)

- KING, RUTH REECE, and others. Bibliography of North American geology, 1951, by R. H. King, Virginia M. Jussen, John S. Pomeroy and Vsevolod L. Skitsky. *United States Geological Survey. Bulletin* 1025, 1955, 378 p. [Listed by authors with subject index.]
- HARWOOD, T. A. *Geology and physiography of the arctic region of north continental America and Greenland.* Ottawa. Department of National Defence, Defence Research Board, 1955. 31 p. illus., map. 27½ cm. (Arctic Report No. 1/55.) [Outline.]
- BONDAM, JAN. The geology and mineralisation of the Mesters Vig area, East Greenland. Part I: general geology. *Meddelelser om Grønland*, Bind 135, Nr. 7, 1955, p. 3-21, illus., maps.
- PEACOCK, J. D. The geology of Dronning Louise Land, N.E. Greenland. *Meddelelser om Grønland*, Bind 137, Nr. 7, 1956, 38 p. illus., maps. [Based on field studies, 1952-54.]
- CORBET, JEAN. Une région karstique de haute-Laponie: Navnlösfjell (la Montagne-qui-a-perdu-son-nom). *Revue de Géographie de Lyon*, Vol. 28, No. 4, 1953, p. 329-44, illus., maps. [Nordland, north Norway.]
- SØRENSEN, HENNING. A preliminary note on some peridotites from northern Norway. *Norsk Geologisk Tidsskrift*, Bind 35, 1955, p. 93-104, illus., map. [Geological observations in area south of Bodø, Nordland, 1952 and 1954; petrology.]
- VYALOV, O. S., and VORONOV, P. S. Kratkoye soobshcheniye o geologicheskoy stroynosti rayona "oazisa" na Zemle Korolevy Mery v antarktide [Short communication on the geological structure of the "oasis" region in Queen Mary Land, Antarctica]. *Doklady Akademii Nauk SSSR* [Reports of the Academy of Sciences of the U.S.S.R.], Tom 109, No. 5, 1956, p. 916-19. [General geological outline of ice-free area.]
- VYALOV, O. S., and VORONOV, P. S. O vykhodakh granitov na beregu Noksa v antarktide [Granite outcrops on Knox Coast, Antarctica]. *Doklady Akademii Nauk SSSR* [Reports of the Academy of Sciences of the U.S.S.R.], Tom 109, No. 6, 1956, p. 1187-90, map. [Description of nunataks at lat. 66° 03' S., long. 107° 41' E.]
- THORARINSSON, SIGURDUR. The crater groups in Iceland. *Bulletin Volcanologique*, Série Tome 14, 1953, 44 p. 17 plates, illus., maps. (Reprint.) [Distribution, morphology, geology, origins.]
- TRYGGVASON, TOMAS, and WHITE, DONALD E. Rhyolitic tuffs in lower tertiary plateau basalts of eastern Iceland. *American Journal of Science*, Vol. 253, No. 1, 1955, p. 26-31, illus., map. [Petrographic study and summary of authors' recent observations.]
- KELLER, FRED, and others. Aeromagnetic surveys in the Aleutian, Marshall and Bermudez islands, by Fred Keller, jr., J. L. Meuschke and L. R. Alldredge. *Transactions. American Geophysical Union*, Vol. 35, No. 4, 1954, p. 558-72, illus., maps. [By U.S. Geological Survey and Office of Naval Research, 1947; efforts to determine future activity of Aleutian volcanoes.]
- SIMONS, FRANK S., and MATHEWSON, DONALD E. Investigations of Alaskan volcanoes. Geology of Great Sitkin Island, Alaska. *United States Geological Survey. Bulletin* 1028-B, vi, 21-43 p. illus., maps (one in end pocket). [Study of Aleutian volcano based on field work in 1946.]
- PIYP, B. I. Klyuchevskaya sopka i yeye izverzheniya v 1944-1945 gg. i v proshlom [Klyuchevskaya Sopka and its eruptions in 1944-45 and in the past]. *Trudy Laboratorii Vulkanologii* [Transactions of the Laboratory of Volcanology], Vypusk 11, 1956, 342 p. illus. [Description and history of eruptions of Kamchatka volcano.]
- HARLAND, W. BRIAN. Tectonic facies, orientation, sequence, style and date. *Geological Magazine*, Vol. 93, No. 2, 1956, p. 111-20. [Outline of tectonic sequence from Friesland, Spitsbergen.]

- HALLER, JOHN. Die syn-und postorogenen Granite der ostgrönländischen Kaledoniden. *Schweizerische Mineralogische und Petrographische Mitteilungen*, Band 35, Heft 2, 1955, p. 280-86, illus., map. [Tectonics of granite series in the east Greenland Caledonian, between 72° and 74° N.]
- FORTIER, Y. O., and THORSTEINSSON, R. The Parry Islands folded belt in the Canadian Arctic Archipelago. *American Journal of Science*, Vol. 251, No. 4, 1953, p. 259-67, illus., map. [Description and geological history.]
- RADFORTH, NORMAN W. Range of structural variation in organic terrain. *Transactions of the Royal Society of Canada*, Third Series, Vol. 49, Section 5, 1955, p. 51-67, illus., map. [Limitations and application of classification system for macroscopic constituents of muskeg.]
- MACFARLANE, I. C., compiler. *A preliminary annotated bibliography on muskeg*. Ottawa, National Research Council, Division of Building Research, 1955. 34 leaves. [Bog, marsh and moorland.]

GLACIOLOGY

- BUTKOVICH, T. R. Density of single crystals of ice from a temperate glacier. *Journal of Glaciology*, Vol. 2, No. 18, 1955, p. 553-59. [Accurate density measurements on ice single crystals from Mendenhall Glacier, Alaska.]
- POPOV, YU. N. Ledniki gornogo massiva Buordakh [Glaciers of the Buordakh mountain massif]. *Geograficheskii Sbornik [Collected papers on Geography]*, Tom 4, 1954, p. 41-58, tables. [Description of 72 glaciers and snow patches near upper Moma, in Indigirka basin.]
- NIELSEN, LAWRENCE E., and POST, AUSTIN S. The Castner glacier region, Alaska. *Journal of Glaciology*, Vol. 2, No. 14, 1953, p. 276-80, illus., map. [Description of Castner, Eel and Canwell Glaciers, their medial moraines and retreat.]
- BADER, HENRI. The Greenland inland ice. *Geographical Review*, Vol. 45, No. 4, 1955, p. 582-83. [Summary of glaciological work by Expéditions Polaires Françaises, 1948-53.]
- BAUER, ALBERT. Contribution à la connaissance du Vatnajökull Islande: première partie. *Jökull*, Ár 5, 1955, p. 11-22, illus., maps. [Calculation of volume, depths, altitudes, of Vatnajökull, Iceland; comparison with Hofsjökull, Langjökull, Myrdalsjökull. Summary in Icelandic.]
- ORVIG, SVENN. The glaciological studies of the Baffin Island Expedition, 1950. Pt. 5. On the variation of the shear stress on the bed of an ice cap. *Journal of Glaciology*, Vol. 2, No. 14, 1953, p. 242-46, illus., map. [Ice thickness measurements from gravity survey used to deduce basal stress on Nye's theory.]
- RÖTHLISBERGER, HANS. Studies in glacier physics on the Penny Ice Cap, Baffin Island, 1953, Part III. Seismic sounding. *Journal of Glaciology*, Vol. 2, No. 18, 1955, p. 539-52, illus., map. [Depth measurements on Penny Ice Cap and Highway Glacier.]
- CORBEL, JEAN. Karsts et glaciers en Laponie. *Revue de Géographie de Lyon*, Vol. 27, No. 3, 1952, p. 257-67, illus., map. [Abisko, Sulitelma and Svartisen regions in Swedish and Norwegian Lapland.]
- BOURGAIN, JEAN-PAUL. Quelques caractères analytiques de la surface et du socle de l'inlandsis groenlandais. *Annales de Géophysique*, Tome 12, No. 1, 1956, p. 75-83, map. (*Rapports scientifiques des Expéditions Polaires Françaises*, No. N. 3.4.) [Relation between shape of bed and shape of surface along seismic profile agrees with Nye's hypothesis.]
- WARD, W. H., and ORVIG, SVENN. The glaciological studies of the Baffin Island expedition, 1950. Pt. 4. The heat exchange at the surface of the Barnes Ice Cap during the ablation period. *Journal of Glaciology*, Vol. 2, No. 13, 1953, p. 158-68, illus. [Experimental study of snow melting and refreezing of melt water on Barnes Ice Cap.]
- HEUBERGER, JEAN-CHARLES. Mesures de températures dans l'ice-cap du Groenland. *Geofisica Pura e Applicata*, Vol. 34, 1956, p. 71-73 (reprint). [Divergence between A. Wegener's results, 1930-31 and those of *Expéditions Polaires Françaises*, 1950; discussion of possible errors.]
- THOMPSON, HUGH R., and BONNLANDER, B. H. Temperature measurements at a cirque bergschrund in Baffin Island: some results of W. R. B. Battle's work in 1953. *Journal of Glaciology*, Vol. 2, No. 20, 1956, p. 762-69, illus. [Temperature measurements carried out by Walter Ravenhill Brown Battle before his death, and deduction on cirque erosion.]
- LOEWE, FRITZ. Notes on firm temperatures and ablation in MacRobertson Land, Antarctica. *Journal of Glaciology*, Vol. 2, No. 20, 1956, p. 725-26. [Observations made at "Mawson" and southwards in 1955.]
- KING, CUCHLAINE AUDREY MURIEL, and IVES, J. D. Glaciological observations on some of the outlet glaciers of south-west Vatnajökull, Iceland, 1954. Part 1. Glacier Regime. *Journal of Glaciology*, Vol. 2, No. 18, 1955, p. 563-69, map, illus.

- PAL'GOV, N. N. Dinamika lednikov Lepsinskoy Kory khrebtu Dzhungarskiy Alatau [Dynamics of the Lepsinskaya Kora glaciers in the Dzhungarskiy Alatau chain] *Voprosy Geografii Kazakhstana* [Questions of the Geography of Kazakhstan], (Alma Ata) Vyp. 1, 1956, p. 125-43, illus., map. [Velocity and ablation measurements on Lednik Satpayev and Lednik Kalesnik.]
- SHARP, ROBERT P. Deformation of a vertical bore hole in a piedmont glacier. *Journal of Glaciology*, Vol. 2, No. 13, 1953, p. 182-84, illus. [Measurement of flow at depth in Malaspina Glacier, Alaska.]
- WARD, WILLIAM H. Studies in glacier physics on the Penny Ice Cap, Baffin Island, 1953. Part IV. The flow of Highway Glacier. *Journal of Glaciology*, Vol. 2, No. 18, 1955, p. 592-99, illus. [Measurement of the velocity of points on Highway Glacier.]
- TODTMANN, E. M. Übersicht über die Eisrandlagen in Kringilsárrani von 1890-1955. *Jökull*, Ár 5, 1955, p. 8-10, map. [Positions of margin of Brúarjökull in Kringilsárrani area, Iceland, 1890-1955, studied by author in 1955. Summary in Icelandic.]
- EYTHÓRSSON, JÓN. Jöklabreytingar 1954/1955. *Jökull*, Ár 5, 1955, p. 40. [Glacier variation in Iceland, 1954-55.]
- WYLLIE, P. J. Ice recession in Dronning Louise Land, north-east Greenland. *Journal of Glaciology*, Vol. 2, No. 20, 1956, p. 704-09, illus., map. [Role of rock barriers in determining the effect of recession on outflow glaciers in Greenland.]
- PAIGE, RUSSELL A. Subglacial stoping or block caving: a type of glacier ablation. *Journal of Glaciology*, Vol. 2, No. 20, 1956, p. 727-29, illus. [Observations by John Gill McCall and the author on unusual method of retreat of Black Rapids Glacier, Alaska, which had sudden advance in 1936-37.]
- MERCANTON, PAUL-LOUIS, and others. Glacier fluctuation, 1952, by P. L. Mercanton, O. Liestøl, H. Kinzl and Jón Eythósson. *Journal of Glaciology*, Vol. 2, No. 14, 1953, p. 290-91. [Statistics of glaciers in advance and retreat in Switzerland, Norway, Austria, Iceland and France.]
- GALLOWAY, R. W. Études morphométriques de galets dans le Lyngsdal (Norvège septentrionale). *Revue de Géomorphologie Dynamique*, Année 7, No. 3-4, 1956, p. 53-56, map, illus. [Comparison of stones from terraces with those in river bed enabled rough estimation to be made of former distance to glacier snout.]
- RUCKLIDGE, MILES A. A glacier water-spout in Spitsbergen. *Journal of Glaciology*, Vol. 2, No. 19, 1956, p. 637-39, illus. [Observation of periodic water-spout on Von Postbrecken and suggestion for its explanation.]
- GÍSLASON, SHARPHEÐINN. Vatnsdalshlaup o. fl. *Jökull*, Ár 5, 1955, p. 46. [Jökullhlaup in Vatnsdal, Iceland, 1955.]
- RIST, SIGURJÓN. Skeiðarárhlaup 1954. *Jökull*, Ár 5, 1955, p. 30-36, illus., map. [Jökullhlaup in Skeiðará area, Iceland, 1954; water-level, velocity, channel measurements, discharge volume. English summary.]
- ÞÓRARINSSON, SIGURÐUR, and RIST, SIGURJÓN. Rannsókn á Kötlu og Kötluhlaupi sumari 1955. *Jökull*, Ár 5, 1955, p. 43-46, illus. [Icelandic glaciological investigations of Höfðabrekkujökull and of Kötlu jökullhlaup, Iceland, summer 1955. Preliminary account.]
- ÞÓRARINSSON, SIGURÐUR, and RIST, SIGURJÓN. Skaftárhlaup í September 1955. *Jökull*, Ár 5, 1955, p. 37-40, illus., map. [Jökullhlaup in the Skaftá river, Iceland, 1955 (ice cauldron near Grimsvötn). English summary.]
- WILSON, J. WARREN. The initiation of dirt cones on snow. *Journal of Glaciology*, Vol. 2, No. 14, 1953, p. 281-87, illus. [Description of dirt cones on snow patches in Jan Mayen and suggested mode of formation.]
- [FLOATING ICE : FORECASTING.] *Report of ice observations and forecasting for the season 1954*. Washington, D.C., U.S. Navy Hydrographic Office, 1954. vi, 65 p. illus., map. 26½ cm. (H.O. Misc. 15869.) [Hydrographic Office's second annual report for Arctic Ocean and adjacent waters.]
- YEVGENOV, N. I. Nekotoryye voprosy terminologii morskikh l'dov [Some questions of terminology of sea ice]. *Meteorologiya i Gidrologiya* [Meteorology and Hydrology], 1956, No. 7, p. 34-36. [Incorrect usage and ambiguities in Russian floating ice terminology.]
- [FLOATING ICE : METHODS OF OBSERVING AND REPORTING.] *Aerial ice reconnaissance observational techniques and recording and reporting procedures. Second edition*. Washington, D.C., U.S. Navy Hydrographic Office, 1956. vi, 12 p. illus. 26½ cm. (H.O. Misc. 15603.)
- EYTHÓRSSON, JÓN. Report on sea ice off the Icelandic coasts in Oct. 1954-Sept. 1955. *Jökull*, Ár 5, 1955, p. 47-51. [Observations in area between Iceland and Greenland around Jan Mayen, lats. 64° to 73° N.]
- FORWARD, C. N. Ice distribution in the Gulf of St. Lawrence during the break-up season. *Geographical Bulletin*, No. 6, 1954, p. 45-84, maps. [Includes maps of ice distribution March-May, 1940-52.]

- HERDMAN, HENRY F. P. The Antarctic pack ice. *National Institute of Oceanography. Collected Reprints*, Vol. 3, No. 107, 1955, [4 p.], illus. (Reprinted from *Trident*, Vol. 17, No. 190, 1955, p. 57-60.) [General article on drift and distribution.]
- NICHOLS, ROBERT L. Marine and lacustrine ice-pushed ridges. *Journal of Glaciology*, Vol. 2, No. 13, 1953, p. 172-75, illus. [Description of ice-pushed ridges, District of Franklin, Canada.]
- HERDMAN, HENRY F. P. The antarctic pack ice in winter. *Journal of Glaciology*, Vol. 2, No. 13, 1953, p. 184-93, illus., maps. [Summary of winter conditions at edge of Antarctic pack ice between 1932 and 1951. *National Institute of Oceanography Collected Reprints*, Vol. 1, 1953, No. 49.]
- NUSSER, FRANZ. Problems of sea ice research. *Journal of Glaciology*, Vol. 2, No. 19, 1956, p. 619-23. [Review of present position.]
- AVILOV, I. K. Moshchnost' sovremennykh osadkov i poslednikovaya istoriya Belogo morya [Thickness of contemporary deposits and post-glacial history of the White Sea]. *Trudy Gosudarstvennogo Okeanograficheskogo Instituta* [Transactions of the State Oceanographical Institute], Vypusk 31 (43), p. 5-57, illus., maps. [Based on sea-bottom cores collected 1926-51.]
- LIND, HARALD. Observations on the Quaternary geology of Andørja-Rolla-Gratangen (Troms, northern Norway). *Acta Borealia. A. Scientia*, No. 9, 1955, 24 p. illus., maps. [Glacial geology.]
- BIRD, J. BRIAN. The glaciation of central Keewatin, Northwest Territories, Canada. *American Journal of Science*, Vol. 251, No. 3, 1953, p. 215-30, maps (one folding, facing p. 224). [Results of author's field and air photograph study.]
- PÉWÉ, TROY L. Origin of the upland silt near Fairbanks, Alaska. *Bulletin of the Geological Society of America*, Vol. 66, 1955, p. 699-724, illus., maps. [Mostly derived from glacial outwash.]
- GALLOWAY, ROBERT W. The structure of moraines in Lyngsdalen, north Norway. *Journal of Glaciology*, Vol. 2, No. 20, 1956, p. 730-33, illus., map. [Measurements of stone orientations in englacial moraine on Lyngsdalsbreen and lateral and terminal moraines below Little Jiek'kevarribreen.]
- MÖLDER, KARL. Siperian kvartäärikautinen mannerjäättikkö ja postglasiaalinen ilmasto. *Terra*, 67 Årg., No. 4, 1955, p. 111-23, maps. [Quaternary ice sheet and postglacial climate in Siberia. German summary.]
- DERRUAU, MAX. Les formes périglaciaires du Labrador-Ungava central comparées à celles de l'Islande centrale. *Revue de Géomorphologie Dynamique*, Année 7, Nos. 1-2, 1956, p. 11-16, illus. [General description. Genesis of polygons observed.]

FROST ACTION ON ROCKS AND SOIL. PERMAFROST

- CORBEL, JEAN. Problèmes de morphologie periglaciaire au Spitzberg. *Proces-verbaux du Cercle d'Études Géographiques de Lyon*, No. 20, [1953?], p. 262-68, illus. [Action of frost and snow on land forms surrounding glaciers.]
- WERENSKIÖLD, WERNER. The extent of frozen ground under the sea bottom and glacier beds. *Journal of Glaciology*, Vol. 2, No. 13, 1953, p. 197-200, illus. [Theory of extent of permanently frozen ground below sea or temperate glacier. Comparison with observations in Spitsbergen.]
- [PERMAFROST TERMINOLOGY.] *Osnovnyye ponyatiya i terminy geokriologii (Merzlotovedeniya)* [Fundamental concepts and terms in geocryology (permafrost studies)]. Moscow, Izdatel'stvo Akademii Nauk SSSR [Publishing House of the Academy of Sciences of the U.S.S.R.], 1956. 16 p. 22 cm. [Definitions, with approved and rejected terms.]
- TWIDALE, C. R. Vallons de gélivation dans le centre du Labrador. *Revue de Géomorphologie Dynamique*, Année 7, Nos. 1-2, 1956, p. 17-23, illus., maps. [Valleys in central Labrador caused by the widening of major structural lines by frost action.]
- VYALOV, S. S. Stsepleniye merzlykh gruntov [Cohesion of frozen soil]. *Doklady Akademii Nauk SSSR* [Reports of the Academy of Sciences of the U.S.S.R.], Tom 104, No. 4, 1955, p. 527-29. [Relation between pressure applied to frozen soil and rate of break-down of cohesion.]
- SHVETSOV, P. F. Proiskhozhdeniye i zakonmernosti rasprostraneniya podzemnykh l'dov [Origin and laws governing distribution of ground ice]. *Vestnik Akademii Nauk SSSR* [Messenger of the Academy of Sciences of the U.S.S.R.], 1956, No. 3, p. 66-69, illus. [Summary of recent investigations in U.S.S.R.]

PHYSICAL GEOGRAPHY. GEOMORPHOLOGY

- BELANGER, MARCEL. Le relief de la région du lac Chibougamau. *Revue Canadienne de Géographie*, Vol. 9, Nos. 2-3, 1955, p. 93-107, maps. [Quebec. Peneplain.]
- [U.S.S.R. : GEOMORPHOLOGY.] Fiziko-geograficheskoye rayonirovaniye severa i vostoka SSSR [Physical geographical zoning of the north and east of the U.S.S.R.]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 5, p. 137-39. [Description of new map, 1:4 million, showing division into natural regions.]
- PANOV, D. G. Kratkiy ocherk geomorfologii antarktiki [Short outline of the geomorphology of the Antarctic]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 6, p. 17-35, maps. [Outline for whole continent, based on available published sources.]
- AVSYUK, G. A., and others. Geograficheskiye nablyudeniya v antarkticheskom "oazise" [Geographical observations in an antarctic "oasis"]. By G. A. Avsyuk, K. K. Markov and P. A. Shumskiy. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [News of the All-Union Geographical Society], Tom 88, No. 4, 1956, p. 316-50, illus., map. [Description of ice-free area near Shackleton Ice Shelf visited by authors, January 1956.]

OCEANOGRAPHY. HYDROGRAPHY. HYDROLOGY

- POLUKAROV, G. V. Vychisleniye garmonicheskikh postoyannykh urovnya dlya Okhotskogo morya [Calculating sea level harmonic constants for the Okhotsk Sea]. *Trudy Gosudarstvennogo Okeanograficheskogo Instituta* [Transactions of the State Oceanographical Institute], Vypusk 33 (45), 1956, p. 92-98, maps. [Phases of M_2 wave calculated.]
- HERDMAN, HENRY F. P., and others. Proposed names of features on the deep-sea floor. 3. Southern or Antarctic Ocean, by H. F. P. Herdman, John D. Wiseman and Cameron D. Ovey. *Deep-Sea Research*, Vol. 3, 1956, p. 253-61. [Names proposed by British National Committee on the Nomenclature of Ocean Bottom Features.]
- JOHNSON, MARTIN W. *The plankton of the Beaufort and Chukchi Sea areas of the Arctic and its relation to the hydrography*. Montreal, Arctic Institute of North America, 1956. 32 p. illus., maps. 25 cm. (Technical Paper No. 1.) [Analysis of zooplankton collections made by U.S.S. *Burton Island* in summers of 1950, 1951. Relates distribution to water movements.]
- DUNBAR, MAXWELL JOHN. Density inversions in Canadian eastern Arctic waters. *Nature*, Vol. 176, No. 4484, 1955, p. 703, illus. [Instances reported by *Calanus* expeditions of 1949-51.]
- [BERING SEA : HYDROGRAPHY.] *Hydrographic data obtained principally in the Bering Sea by training ship "Oshoro Maru" in the summer of 1955*. Hakodate, Faculty of Fisheries Hokkaido University, 1956. [ii], 60 p. map. 28 cm. [Papers to be submitted to conference on Pacific oceanography, Honolulu, 13-17 February 1956.]
- BOGOROV, V. G. Issledovaniya na ekspeditsionnom sudne "Vityaz'" v Tikhom okeane [Investigations in the expedition ship 'Vityaz' in the Pacific]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 2, p. 3-5, map. [Summary of 22 Soviet oceanographic cruises, 1949-55, organised by Institut Okeanologii.]
- KLUMOV, S. K. Nekotoryye itogi ekspeditsii v Beringovo more i na Kuril'skiye ostrova [Some results of an expedition to the Bering Sea and Kuril'skiye Ostrova]. *Vestnik Akademii Nauk SSSR* [Messenger of the Academy of Sciences of the U.S.S.R.], 1956, No. 5, p. 32-37, maps. [Outline of oceanographical work done by expedition in *Nerpa* and *Krylatka*, 1955.]
- ZENKEVICH, L. A. Noveyskiye okeanologicheskiye issledovaniya severo-zapadnoy chasti Tikhogo okeana [Recent oceanographical investigations of the north-west part of the Pacific Ocean]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 4, p. 26-37, illus. [Summary of oceanographical (both physical and biological) work on cruises of *Vityaz'* in Okhotsk, Japan and Bering Seas, 1949-55.]
- CHERNOVSKAYA, YE. N. *Gidrologicheskiye i gidrokhimicheskiye usloviya na litorali vostoka Murmana i Belogo morya* [Hydrological and hydrochemical conditions along the litoral of eastern Murman and of the White Sea]. Moscow, Leningrad, Izdatel'stvo Akademii Nauk SSSR [Publishing House of the Academy of Sciences of the U.S.S.R.], 1956. 116 p. map. 20 cm. [Chiefly concerned with seasonal changes in temperature and chemical composition of sea water.]

- CARY, ALBERT P. Bathymetric chart of the Arctic Ocean along the route of T-3, April 1952 to October 1953. Carte bathymétrique de l'océan arctique le long de la route suivie par T-3, d'avril 1952 à octobre 1953. *International Hydrographic Bulletin*, No. 2, 1955, p. 49-54, illus., maps. [Results of studies during U.S. Air Force operations on Fletcher's Ice Island, 1952. In French and English. Reproduced from *Bulletin of the Geological Society of America*, Vol. 65, 1954, p. 709-12.]
- MAKEROV, YU. V. *Antarktika. Chast' II. Osnovnyye cherty gidrologicheskogo rezhima antarkticheskikh vod* [The Antarctic. Part II. Main features of the hydrological regime of antarctic waters]. Leningrad, Gidrometeorologicheskoye Izdatel'stvo [Hydrological and Meteorological Publishing House], 1956. 118 p. maps. 27 cm. [Characteristics of antarctic water masses and of sea and land ice.]
- CAILLEUX, ANDRÉ, and TAYLOR, GÉRARD. Les débits des eaux de l'Eqe (Groenland occidental). *Union Géodésique et Géophysique Internationale, Association Internationale d'Hydrologie Scientifique. Assemblée Générale de Rome, 1954*, Tome 3, [1956], p. 465-71, map. [Results of measurements of rates of flow of non-glacial streams, summers 1948 and 1949.]
- CAILLEUX, ANDRÉ, and TAYLOR, GÉRARD. Les températures des eaux de l'Eqe (Groenland occidental). *Union Géodésique et Géophysique Internationale, Association Internationale d'Hydrologie Scientifique. Assemblée Générale de Rome, 1954*, Tome 3, [1956], p. 456-64. [Results of measurements made June-August 1948 and 1949 in ponds and non-glacial streams.]
- [CANADIAN ARCTIC : WATER SUPPLY.] Surface water supply of Canada. Arctic and western Hudson Bay drainage... in British Columbia, Alberta, Saskatchewan, Manitoba, the Northwest Territories and western Ontario. Climatic years 1949-50 and 1950-51. *Water Resources Paper* (Canada. Department of Northern Affairs and National Resources), No. 109, 1954, 515 p., map.

METEOROLOGY. CLIMATOLOGY

- [ANTARCTIC : METEOROLOGY.] [Southern hemisphere project of the Weather Bureau, South Africa.] Tables, diagrams and charts presented in *Notos*, Volume 4. *Notos*, Vol. 4, No. 4, 1955, p. 294, 309-68, maps. [Data for September-November 1954. Earlier data tables *ibid.*, Vol. 1, No. 1, 1952, onwards.]
- ATWOOD, WALLACE J., jr. The International Geophysical Year: a twentieth-century achievement in international cooperation. *Department of State Bulletin* (Washington, D.C.), Vol. 35, No. 910, 1956, p. 880-86, maps. [General account by Director of Offices of International Relations of the United States National Research Council.]
- HEAP, JOHN. International activity in Antarctica 1955-56. *Scottish Geographical Magazine*, Vol. 72, No. 2, 1956, p. 113-16, illus. [Plans for Commonwealth Trans-Antarctic Expedition, 1955-59, and Antarctic projects of the International Geophysical Year, 1957-58.]
- ROBIN, GORDON DE QUETTEVILLE. Why an International Geophysical Year? *Geographical Magazine*, Vol. 28, No. 12, 1956, p. 611-18, illus., map. [History of previous and present polar years.]
- [INTERNATIONAL GEOPHYSICAL YEAR, 1957-58.] *British National Committee for the International Geophysical Year. United Kingdom report to the third antarctic conference (Paris 30 July-3 August 1956)*. London, Royal Society, 1956. 16 p. illus. 24½ cm. [Work done at Royal Society base, Halley Bay, Coats Land, 1956.]
- [INTERNATIONAL GEOPHYSICAL YEAR, 1957-58.] Antarctic expedition highlights. *Asahi Picture News* (Tokyo), [January], 1956, p. 27-58, illus. (including ports), map. [Includes Japanese preparations for International Geophysical Year, 1957-58. Illustrated supplement with English sub-titles.]
- KAPLAN, JOSEPH. United States programme for the International Geophysical Year. *Nature*, Vol. 178, No. 4535, 1956, p. 665-67. [Outline.]
- LOON, HARRY VAN. A note on meridional atmospheric cross-sections in the southern hemisphere. *Notos*, Vol. 4, No. 2, 1955, p. 127-29, illus. [Upper air observations. South Indian Ocean sections, combining data from Heard Island, "Operation High-jump", "Little America", and "Maudheim" compared with Australasian cross-section.]
- SCHWERTFEGER, W., and PROHASKA, F. Análisis de la marcha anual de la presión y sus relaciones con la circulación atmosférica, en Sudamérica austral y la Antártida. *Meteoros*, Año 5, No. 4, 1955, p. 223-37, maps. [Mean annual pressure variation in Tierra del Fuego in October and November related to meteorological conditions in southern South America and the Antarctic.]
- VOWINCKEL, E. Southern hemisphere weather map analysis; five year mean pressures. *Notos*, Vol. 4, No. 1, 1955, p. 17-55; Vol. 4, No. 3, 1955, p. 202-16, maps. [Part 1:

- tables of monthly pressure at sea level at fixed points, and charts of mean monthly sea-level pressure. Part 2: study of general circulation of southern hemisphere in light of data given.]
- DIAZ, EMILIO L. Interrelaciones entre anomalías mensuales de lluvias, temperatura, presión, gradientes y variaciones. *Meteoros*, Año 3, No. 4, 1953, p. 342-82, illus. [Relates atmospheric circulation over South Georgia, South Orkneys and Falkland Islands to climate in Argentine cattle-raising area.]
- STOLL, ALICE M., and HARDY, JAMES D. Thermal radiation measurements in summer and winter Alaskan climates. *Transactions. American Geophysical Union*, Vol. 36, No. 2, 1955, p. 213-26, illus. [Use of panradiometer and thermo-radiometer. Instruments described: methods and results.]
- LOON, HARRY VAN. Mean air-temperature over the southern oceans. *Notos*, Vol. 4, No. 4, 1955, p. 292-308, illus., maps. [Maps of mean air-temperature and of annual range and iso-anomalies; discussion.]
- DEFANT, FRIEDRICH. Über die Struktur hochtroposphärischer Düsenströme, insbesondere des subtropischen Strahlstroms über Nordamerika. *Berichte des Deutschen Wetterdienstes*, Band 4, Nr. 22, 1956, p. 126-33, illus. [Upper air structure over North American arctic.]
- ABEL, G. C. *Report of the first year's flying on the development of flight testing techniques for finding and measuring natural icing conditions*. London, Her Majesty's Stationery Office, 1956. 58 p. illus. 32½ cm. 4s. 6d. (Ministry of Supply, Aeronautical Research Council, Current Papers, No. 221.) [Report on Aeroplane and Armament Experimental Establishment's programme.]
- ABEL, G. C. *Report of the third year's flying on the development of flight testing techniques for finding and measuring natural icing conditions*. London, Her Majesty's Stationery Office, 1956. 28 p. illus. 32½ cm. 3s. 0d. (Ministry of Supply, Aeronautical Research Council, Current Papers, No. 223.) [Report on Aeroplane and Armament Experimental Establishment's programme.]
- KOTLYAKOV, V. M. Mezhdudomstvennoye soveshchaniye po izucheniyu snega i snezhnogo pokrova [Inter-departmental meeting on study of snow and snow cover]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 4, p. 160-62. [Meeting in April 1956 on practical and theoretical aspects.]
- RIKHTER, G. D. Poyavleniye snezhnogo pokrova [Appearance of snow cover]. *Priroda* [Nature] (Moscow), 1956, No. 11, p. 123-24, map. [Map showing average dates of first appearance of snow cover on territory of U.S.S.R.]
- CHAPLIN, J. H. A note on snow crystal types in the Falkland Islands Dependencies. *Journal of Glaciology*, Vol. 2, No. 20, 1956, p. 733-34. [Records of snow crystal type, temperature and weather situation from Admiralty Bay (South Shetland Islands) and Port Lockroy (Palmer Archipelago).]
- RIKHTER, G. D., ed. *Sneg i talye vody. Ikh izucheniye i ispol'zovaniye* [Snow and melt water. Their study and use]. Moscow, Izdatel'stvo Akademii Nauk SSSR [Publishing House of the Academy of Sciences of the U.S.S.R.], 1956. 272 p. 27 cm. [Collected papers on physical and mechanical properties of snow, melting, run-off, and influence of snow cover on weather and vegetation.]
- THURONYI, GEZA, and others. A selective annotated bibliography on the micrometeorology of snow cover (Supplement), by Geza Thuronyi, N. T. Zikeev and Malcolm Rigby. *Meteorological Abstracts and Bibliography*, Vol. 7, No. 8, 1956, p. 1009-25. [Abstracts of 74 references, classified by Universal Decimal Classification.]
- GEORGI, JOHANNES. Temperatur-und Dichtemessungen des grönländischen Inlandeises. *Annales de Géophysique*, Tome 12, No. 1, 1956, p. 102-110, illus. (*Rapports scientifiques des Expéditions Polaires Françaises*, No. N. 4.4.) [Heuberger's observations of temperature of annual layers of névé in central Greenland confirm Sorge's hypothesis. Plea for further research, 1957-58. French and English summaries.]
- L'VOVICH, M. I. Parnikovyy effekt pri snegotayanii [Hothouse effect when snow melts]. *Izvestiya Vsesoyuznogo Geograficheskogo Obshchestva* [News of the All-Union Geographical Society], Tom 88, Vypusk 6, 1956, p. 526-32. [Study of ablation of snow by solar radiation in negative air temperatures.]
- KENDREW, W. G., and CURRIE, B. W. *The climate of central Canada; Manitoba, Saskatchewan Alberta and the Districts of Mackenzie and Keewatin*. Ottawa, Queen's Printer, 1955 x, 194 p. illus., tables. 24½ cm. \$1.00.
- DALE, ROBERT F. *The climate of the Matanuska Valley*. Washington, D.C., U.S. Government Printing Office, 1956. vi, 26 p. illus., maps. 26 cm. (U.S. Weather Bureau, Technical Paper No. 27.) [Based on records kept since 1917 by Matanuska Agricultural Experiment Station, Alaska.]
- VOWINCKEL, E. Synoptische Klimatologie vom Gebiet Marion Island. *Notos*, Vol. 3, No. 1

- 1954, p. 12-21, illus., maps. [Climate of Marion Island with special reference to weather types and air masses. Includes data.]
- VOWINCKEL, E., and OOSTHUIZEN, C. M. Weather types and weather elements over the Antarctic Ocean during the whaling season. *Notos*, Vol. 2, No. 3, 1953, p. 157-82, maps, diags. (two folding at end). [Analysis of ships' observations, summers 1949-53. Charts show cloud, visibility, fog, gales, temperature, windroses and ice limits.]
- VISSER, S. W. The Novaya-Zemlya phenomenon. *Verhandelungen van het Koninklijk Nederlandsche Akademie van Wetenschappen*, Series B, 59, No. 4, 1956, p. 375-85, illus. [Investigation of theories concerning reflection of sun's image in high latitudes.]
- ARMSTRONG, E. B., and DALGARNO, A., editors. *The airglow and the aurorae; a symposium held at Belfast in September, 1955*. London and New York, Pergamon Press, [1956]. x, 420 p. illus. 25 cm. £7. 10s. 0d. (Vol. 5 of Special Supplements to *Journal of Atmospheric and Terrestrial Physics*.) [Survey of most recent work on observational, experimental and theoretical aspects of these phenomena.]

STRATIGRAPHY. PETROLOGY

- MOORHOUSE, M. D., and SHEPHERD, J. H. Geology of the California Lake area, Oxford Lake mining division, Northern Manitoba. *Province of Manitoba, Mines Branch, Publication* 53-3, 1954, [iv], 22 p. map (in end pocket). [Pre-Cambrian volcanic-sedimentary series folded and intruded by acid plutonics and later basic dykes.]
- CHRISTIE, A. M., and others. Preliminary map. Central Labrador Coast, Newfoundland (descriptive notes), by A. M. Christie, S. M. Roscoe, and W. F. Fahrig. *Canada. Geological Survey Paper*, 53-14, 1953, [ii], 3 p. map (in end pocket). [Proterozoic and Archean.]
- ANWAR, Y. M. Geological investigations in east Greenland: Part V: the petrography of the Prinsen af Wales Bjerge lavas. *Meddelelser om Grønland*, Bind 135, Nr. 1, 1955, 31 p. illus., map. [Description of collections made in 1935-86.]
- BERTHELSEN, ASGER. Structural studies in the pre-Cambrian of western Greenland I: a small body of diorite, Godthaab district. *Meddelelser om Grønland*, Bind 135, Nr. 6, 1955, 29 p. illus., maps. [Field work by author, 1953-54.]
- FOLINSBEE, R. E. Archean monazite in beach concentrates, Yellowknife geologic province, Northwest Territories, Canada. *Transactions of the Royal Society of Canada*, Vol. 49, Series 3, 1955, Section 4, p. 7-24, illus., map. [Study of detrital minerals, of which monazite is the most important, occurring in beach placers formed from esker sands at Yamba Lake.]

ECONOMIC GEOLOGY. MINERALS

- ROBINSON, G. D., and TWENHOFEL, W. S. Some lead-zinc and zinc-copper deposits of the Ketchikan and Wales districts, Alaska: a description of the deposits at Moth Bay, Mahoney Creek, and Dora Lake. *Geological Survey Bulletin* 998-C, 1953, v, p. 59-83, illus., maps (one folding at end).
- WARREN, HARRY V., and DELAVAUULT, ROBERT E. Biogeochemical prospecting in northern latitudes. *Transactions of the Royal Society of Canada*, Vol. 49, Series 3, 1955, Section 4, p. 111-15. [Analysis of ash from trees and plants in areas of permafrost or poor soil can be used to detect anomalously high concentrations of metals in rock substratum.]
- GAULT, H. R., and others. Some zinc-lead deposits of the Wrangell district, Alaska: a description of the deposits at Groundhog Basin, Glacier Basin, the Lake claims, and Berg Basin, by H. R. Gault, D. L. Rossman, G. M. Flint, jr., and R. G. Ray. *Geological Survey Bulletin* 998-B, 1953, iv, p. 15-58, illus., maps (some folding at end).
- KULLERUD, GUNNAR, and others. The temperatures of deposition of sphalerite-bearing ores in the Caledonides of northern Norway, by G. Kullerud, [Peter] Padget and F. M. Vokes. *Norsk Geologisk Tidsskrift*, Bind 35, 1955, p. 121-27, illus., map. [Based on samples from six localities.]
- KIND, NATAL'YA. Pipe of peace. *Soviet Union* (Moscow), No. 7 (77), 1956, p. 18-19, illus. [Investigation of diamond deposit in Yakutskaya A.S.S.R., 1953-55.]

PALAEONTOLOGY

- BOSE, M. N. *Sciadopitytes variabilis* n.sp. from the Arctic of Canada. *Norsk Geologisk Tidsskrift*, Bind 35, 1955, p. 53-67, illus. [Description based on leaves collected from coal seams on Padloping Island, Northwest Territories, 1953.]

- TAPPAN, HELEN. Foraminifera from the arctic slope of Alaska. Part 2. Jurassic foraminifera. *United States Geological Survey Professional Paper* 236-B, 1955, p. 21-86, illus., 28 plates, maps. [Systematic descriptions of 111 species, 36 new.]

BIOLOGY. ARCHAEOLOGY. ANTHROPOLOGY

- OSWALT, WENDELL. The saucer-shaped Eskimo lamp. *Anthropological Papers of the University of Alaska*, Vol. 1, No. 2, 1953, p. 15-23, illus. [Study of prehistoric pottery lamps in University of Alaska Museum.]
- TOLSTOV, A. N., and SHVETSOV, P. F. Dannyye geologicheskogo i geomorfologicheskogo obsledovaniya mesta stoyanki neoliticheskogo cheloveka na Kolymskoy protoke reki Indigirki [Data from geological and geomorphological investigation of the site of neolithic man on the Kolymskiy Protok of the river Indigirka]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 3, p. 85-89, illus. [Analysis of deposits surrounding spot where remains of neolithic man were found at mouth of Indigirka.]
- SERNING, INGA. Lapska offerplatsfynd från järnålder och medeltid i de svenska lappmarkerna. *Acta Lapponica*, 11, 1956, illus., 65 plates, map. [Objects from iron age and medieval Lapp sacrificial sites in Swedish lappmarks. English summary.]
- ALEKSEYEV, V. P. K kraniologii Nnganasanov [Craniology of the Nnganasany]. *Akademiya Nauk SSSR. Institut Etnografi imeni N.N. Miklukho-Maklaya. Kratkiye Soobshcheniya* [Academy of Sciences of the U.S.S.R. N.N. Miklukho-Maklay Institute of Ethnography. Short Communications], No. 24, 1955, p. 57-65. [Skull measurements of Nnganasany (formerly Tavgiyskiye Samoyedy) compared with those of neighbouring peoples.]
- PADY, S. M., and KAPICA, L. Fungi in air over the Atlantic Ocean. *Mycologia*, Vol. 47, No. 1, 1955, p. 34-50, illus. [Numbers and types of spores encountered in polar and tropical air during transatlantic flights in 1951.]
- BAALSBRUD, KJELL. Utnyttelse av plankton. *Norsk Hvalfangst-Tidende*, Årg. 44, Nr. 3, 1955, p. 125-33. [Plankton: utilization as food, harvesting, chemical composition. In Norwegian and English.]
- FISH, CHARLES J. Preliminary observations on the biology of boreo-arctic and subtropical oceanic zooplankton populations. *University of Rhode Island, Narragansett Marine Laboratory, Contribution No. 10*. (Reprinted from Symposium on Marine and Freshwater Plankton in the Indo-Pacific, 1954.) [Preliminary report on plankton collections made at boreo-arctic and sub-tropical weather stations in North Atlantic, 1950-51.]
- FOXTON, P. The distribution of the standing crop of zooplankton in the Southern Ocean. *Discovery Reports*, Vol. 28, 1956, p. 191-236, illus., map. [Abundance of plankton in different parts of Southern Ocean, variations, and comparison with other regions.]

BOTANY

- GRICHUK, V. P., and FEDOROVA, R. V. K voprosu o kharakteristike prilednikovoy rastitel'nosti chetvertichnogo perioda na severe Aziatskogo materika [Characteristics of pre-glacial vegetation of the quaternary period in the north of the continent of Asia]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 2, p. 66-71. [Pollen analysis of samples from fossil ice in Ostrova Novosibirskiy and from central Yakutskaya A.S.S.R.]
- ROUSSEAU, JACQUES. The value of botany as an indicator of unglaciated areas. *Mémoires du Jardin botanique de Montréal*, 1953, No. 40, 8 p. (Reprinted from *Proceedings of the Seventh Pacific Science Congress*, Vol. 5, 1953.) [Discussion, with special reference to conclusions of M. L. Fernald in Labrador.]
- FOGED, NIELS. Diatoms from Peary Land, North Greenland. *Meddelelser om Grønland* Bind 128, Nr. 7, 1955, 90 p. 14 plates, maps. [Collected in 1948-50: ecology, sample analysis, systematic list.]
- WIGGINS, IRA L. *Cystopteris dickieana* and *Woodsia glabella* in arctic Alaska. *American Fern Journal*, Vol. 44, No. 3, 1954, p. 97-108, illus. [Description of mosses collected in 1951 and 1952.]
- ROUSSEAU, JACQUES, and RAYMOND, MARCEL. New Quebec stations for *Woodsia glabella* R.Br. *Archivum Societatis Zoologicae Fennicae "Vanamo"*, 9: suppl., 1955, p. 313-19, map. [Known localities in North America; ecology.]
- GRÖNTVED, JOHANNES. De grønlandske pilearter og deres økonomiske betydning. *Grønland* 1955, Nr. 9, p. 330-35, illus. [Greenland willow species (*Salicaceae*) and their economic importance.]

RASMUSSEN, GUNVOR. Studier över björkens höjdgränser på fjället Krappesvaare. *Svensk Geografisk Årsbok*, Årg. 31, 1955, p. 73–81, illus., maps. [Tree-line of birch (*Betula*) on mountain Krappesvaare, Pite lappmark, north Sweden. German summary.]

ZOOLOGY

- SDOBNIKOV, V. M. *Po tayge i tundre. Zapiski naturalista [In tayga and tundra. A naturalist's notes]*. Moscow, Gosudarstvennoye Izdatel'stvo Geograficheskoy Literatury [State Publishing House for Geographical Literature], 1956. 232 p. illus. 20 cm. [Birds and beasts of Soviet Arctic. Enlarged edition of author's *Po arkticheskoy tundre* (Moscow, 1953).]
- MIGOT, ANDRÉ. *La faune des îles Kerguelen et de l'Antarctique*. Paris, Connaissance du Monde, 1955. 99 p. illus. 22 cm. (*Images de connaissance du monde.*) [Photographs of animals and birds.]
- BEYER, FREDRIK. A new record of *Tetraplatia* (Pteromedusae). *Nytt Magazin for Zoologi*, Vol. 3, 1955, p. 106–112, illus. [Two specimens of Coelenterate *Tetraplatia volitans* Busch collected during *Brategg* expedition, December 1947, at 52° 50' S., 90° 03' W.]
- MADSEN, F. JENSENIUS. Echinoderms other than Holothurians collected in sub-antarctic and antarctic seas, mainly by the Norwegian expeditions 1928–30. *Scientific Results of the Norwegian Antarctic Expeditions 1927–1928 et sqq.*, No. 37, 1955, 17 p. illus. [Classified list, with date and place of collection, and notes.]
- BERNASCONI, IRENE. Algunos asteroideos de Antártida. *Anales de la Sociedad Científica Argentina*, Enero-Marzo, E. I a III, Tomo 161, 1956, p. 7–30, illus. (Reprint.) [Asteroidea collected by A. Nani in South Shetland Islands and Graham Land, 1952–53.]
- GAILLARD, JEAN M. Missions du Batiment Polaire "Commandant Charcot". Récoltes faites en Terre Adélie (1950) par M. Paul Tchernia. 3. Mollusques, par J. M. Gaillard. *Bulletin du Muséum (National) d'Histoire Naturelle* (Paris), 2e. série, Tome 26, No. 6, 1954, p. 678–84, illus. [Description of *Mollusca* collected by P. Tchernia in Terre Adélie, 1950.]
- GHIRARDELLI, ELVEZIO. Chetognati. Échantillons rapportés par les docteurs J. Sapin-Jaloustre et G. Cendron, médecins-biologistes des deux expéditions en Terre Adélie, 1949–1951. (Expéditions Polaires Françaises de Paul Emile Victor.) *Bollettino di Zoologia* (Naples), Vol. 20, N. 1–2–3, 1953, p. 39–48. (Reprinted by Rosenberg and Sellier, Turin.) [Text in Italian. *Eukrohnia hamata* Möbius described.]
- HAMMER, MARIE SIGNE. Alaskan Oribatids. *Acta Arctica*, Fasc. 7, 1955, 36 p. illus. [94 species identified in 34 samples collected mainly 1948–49.]
- WEBER, NEAL A. Arctic Alaskan Hymenoptera and Coleoptera. *Entomological News*, Vol. 64, No. 10, 1953, p. 256–50. [List of specimens collected in 1950.]
- HAMMER, MARIE SIGNE. Investigations on the microfauna of northern Canada. Part II. *Collembola*. *Acta Arctica*, Fasc. 6, 1953, 108 p. illus., maps. [Study of 630 samples (97 species) collected in various parts of arctic Canada, 1948; ecology, distribution.]
- WEBER, NEAL A. Arctic Alaskan Diptera. *Proceedings of the Entomological Society of Washington*, Vol. 56, No. 2, 1954, p. 86–91. [List of specimens collected, 1948–50.]
- BECKEL, W. E., and COPPS, T. P. Notes on the rearing of *Chaoborus* sp. in the Churchill, Manitoba region. *Defence Research Northern Laboratory*, DRNL Technical Paper, No. 12, 1954, [5 p.], illus. [Possible diapause in larval stage.]
- BECKEL, W. E., and COPPS, T. P. *An analysis of factors of importance to the rearing of northern mosquito larvae*. Ottawa, Department of National Defence, Defence Research Northern Laboratory, 1955. 21 leaves, tables. 27½ cm. (DRNL Report No. 6/55.) [Optimum conditions for survival of *Aedes communis* larvae.]
- BECKEL, W. E. *A method of separating fertilized from non-fertilized mosquito eggs*. Ottawa, Defence Research Board, 1955. 2 leaves. (DRNL Technical Memorandum No. 6/55.) [*Aedes*.]
- BECKEL, W. E. Oviposition site preference of *Aedes* mosquitoes (Culicidae) in the laboratory. *Mosquito News*, Vol. 15, No. 4, 1955, p. 224–28. [Experiments with surfaces of differing colour, texture and moisture content.]
- BECKEL, W. E. *The presence of chitin in the transparent cuticle of the mosquito egg. (Aedes hexodontus Dyar)*. Ottawa, Defence Research Board, 1955. 2 leaves. (DRNL Technical Memorandum No. 5/55.)
- BECKEL, W. E. Studies of the biology of the *Aedes* of northern Canada (Culicidae). 2. Preliminary observations on a hatching stimulus for the eggs. *Canada. Defence Research Northern Laboratory, DRNL Technical Paper No. 7, 1953* [iii], 3 p. [Results of experiments using an infusion of decaying mosquitoes to cause hatching.]
- GOETGHEBUER, M. Deux Chironomides nouveaux du Groenland (Dipt. Nemat.) *Bulletin de l'Association Philomathique d'Alsace et de Lorraine*, Tome 9, Fasc. 3, 1955, p. 167, illus. [*Trichocladius ater* nov.sp. and *Trichocladius lucidus* Staeg., var. *baueri* nov., described.]

- BECKEL, W. E. Studies of the biology of the *Aedes* of northern Canada (Culicidae). 5. Laboratory rearing of the adults. *Canada. Defence Research Northern Laboratory DRNL Technical Paper*, No. 10, 1954, 7 p. [Experimental attempts to establish continuous colony of mosquitoes.]
- BECKEL, W. E., and COPPS, T. P. *A study of the diapause in the eggs of northern Aedes (Culicidae)*. Ottawa, Department of National Defence, Defence Research Northern Laboratory, 1955. 20 leaves, tables. 27½ cm. (DRNL Report No. 5/55.) [Experiments exposing eggs to various conditions, including low temperature, light and chemicals.]
- FROHNE, WILLIAM C. Biology of an Alaskan mosquito, *Culiseta alaskaensis* (Ludl.) *Annals of the Entomological Society of America*, Vol. 47, No. 1, 1954, p. 9-24, illus. [Habitat and life cycle of immatures and adults also discussed.]
- FROHNE, WILLIAM C. Mosquito breeding in Alaskan salt marshes, with especial reference to *Aedes punctodes* Dyar. *Mosquito News*, Vol. 13, No. 2, 1953, p. 96-103. [Studies in a subarctic and a temperate zone.]
- BANFIELD, A. W. F. Role of ice in the distribution of mammals. *Journal of Mammalogy*, Vol. 35, No. 1, 1954, p. 104-07. [Movement, especially of land species, over frozen lakes and seas.]
- COHEN, DANIEL M. Age and growth studies on two species of whitefishes from Point Barrow, Alaska. *Stanford Ichthyological Bulletin*, Vol. 4, No. 3, 1954, p. 168-87, illus. [Study of fresh-water fish, *Coregonus nasus kenncotti* Milner and *Coregonus sardinella* (Valenciennes).]
- MIRONOVA, N. V. *Pitaniye i rost molodi treskovykh ryb v pribrezhnoy zone vostochnogo Murmara* [Feeding and growth of young cod in coastal waters of eastern Murman]. Moscow, Leningrad, Izdatel'stvo Akademii Nauk SSSR [Publishing House of the Academy of Sciences of the U.S.S.R.], 1956. 100 p. 20 cm. [*Gadidae*; based on field work, 1949-54.]
- ELLIS, D. V. Observations on the migration, distribution and breeding of birds in the Canadian Arctic during 1954 and 1955. *Dansk Ornithologisk Forenings Tidsskrift*, Vol. 50, 1956, p. 207-30, map, illus. [Species seen during journey from Coppermine to Pond Inlet.]
- [SWEDEN : BIRDS.] *Förteckning över Sveriges fåglar: utgiven av Sveriges Ornithologiska Förening. Tredje upplagan*. Stockholm, Bokförlaget Svensk Natur, 1954. 105 p. map. 19½ cm. 7:50 Sw. Kr. [Classified list of 833 birds recorded in Sweden, with notes on habitat, status and migration for each species. English key.]
- WILKINSON, J. South Sandwich Islands—Bird life. *Sea Swallow (Annual Report of the Royal Naval Bird Watching Society)*, Vol. 9, 1956, p. 18-20. [Observations from H.M.S. *Protector*, 15-19 March 1956.]
- MARTINSEN, M., and WILDHAGEN, A. Ringmerking av forskjellige fuglearter: ringmerkingsresultat VIII. *Statens Viltundersøkelser*, 1955, 50 p. [List of birds ringed in Norway and recaptured, in 1953 and 1954.]
- LINDHOLM, EARL. Bar-tailed Godwit at Macquarie Island. *Emu*, Vol. 52, Part 3, 1952, p. 213. [*Limosa lapponica novaezealandiae* collected on 20 December 1951.]
- BEER, J. V., and others. Some photographic studies of White-fronted and Lesser White-fronted Geese, by J. V. Beer, C. T. Dalgety, Niall Rankin, P. O. Swanberg and Philip Wayne. *British Birds*, Vol. 49, No. 6, 1956, p. 216-18, illus. [*Anser erythropus* in Lapland and *Anser albifrons* in Greenland and Alaska.]
- BENINGTON, ARNOLD, and others. Some photographic studies of the Pink-footed Goose, by Arnold Benington, Niall Rankin and G. K. Yates. *British Birds*, Vol. 49, No. 5, 1956, p. 172-73, illus. [*Anser arvensis brachyrhynchus* in Iceland.]
- GUDMUNDSSON, FINNUR. Íslenzkir fuglar VIII. Kjói (*Stercorarius parasiticus* (L.)) *Náttúrufræðingurinn*, Árg. 24, 1. Hefti, 1954, p. 16-21, illus. [Status of Arctic Skua in Iceland. English summary.]
- GUDMUNDSSON, FINNUR. Íslenzkir fuglar IX. Skúmur (*Stercorarius skua* (Brün.)) *Náttúrufræðingurinn*, Árg. 24, 3. Hefti, 1954, p. 123-36, illus., map. [Status of Great Skua in Iceland. English summary.]
- BOURNE, W. R. P. Migrations of the Sooty Shearwater. *Sea Swallow (Annual Report of the Royal Naval Bird Watching Society)*, Vol. 9, 1956, p. 23-25. [*Puffinus griseus*.]
- DELL, R. K. The Blue Petrel in Australasian waters. *Emu*, Vol. 52, Part 3, 1952, p. 147-54, map. [*Halobaena caerulea*. Collected records; discussion of breeding areas and non-breeding flight range.]
- GUDMUNDSSON, FINNUR. Íslenzkir fuglar X. Svartbakur (*Larus marinus* L.). *Náttúrufræðingurinn*, Árg. 24, 4. Hefti, 1954, p. 177-83, illus. [Status of Great Black-backed Gull in Iceland. English summary.]
- DOWNES, M. C. Arctic Terns in the subantarctic. *Emu*, Vol. 52, Part 4, 1952, p. 306-10, illus. [Records of *Sterna macrura* by members of Australian National Antarctic Research Expedition, 1950 and 1951.]

- WARHAM, JOHN. The breeding of the Great-winged Petrel, *Pterodroma macroptera*. *Ibis*, Vol. 98, No. 2, 1956, p. 171-85, illus. [Studies on Eclipse Island, Western Australia, of species with circumpolar distribution in Southern Ocean.]
- GUDMUNDSSON, FINNUR. Íslenzkir fuglar VII. Súla (*Sula bassana* (L.)). *Náttúrufræðingurinn*, Árg. 23, 4. Hefti, 1953, p. 170-77, illus. [Status of Gannet in Iceland. English summary.]
- BEHN, F., and others. The geographic distribution of the Blue-eyed shags, *Phalacrocorax albiventer* and *Phalacrocorax atriceps*, by F. Behn, J. D. Goodall, A. W. Johnson and R. A. Phillippi B. *Auk*, Vol. 72, No. 1, 1955, p. 6-13, illus. [Review of existing knowledge, with new evidence.]
- GUDMUNDSSON, FINNUR. Íslenzkir fuglar VI. Teista (*Cepphus grylle* (L.)). *Náttúrufræðingurinn*, Árg. 23, 3. Hefti, 1953, p. 129-32, illus. [Status of Black Guillemot in Iceland. English summary.]
- GUDMUNDSSON, FINNUR. Íslenzkir fuglar V. Lundi (*Fratercula arctica* (L.)). *Náttúrufræðingurinn*, Árg. 23, 1. Hefti, 1953, p. 43-46, illus. [Status of Puffin in Iceland. English summary.]
- LEARMONTH, NOEL F. Thick-billed Penguins (*Eudyptes pachyrhynchus*) at Portland, Victoria. *Emu*, Vol. 52, Part 3, 1952, p. 199-201. [Summary of records.]
- HANSON, HAROLD C. Muskeg as Sharp-tailed Grouse habitat. *Wilson Bulletin*, Vol. 65, No. 4, 1953, p. 235-41, illus. [*Pedioecetes phasianellus*: its dancing ground west and south of James Bay and Hudson Bay: explanation of its presence.]
- AINSWORTH, GEORGE H. Sight recoveries of colour-ringed Snow Buntings. *British Birds*, Vol. 49, No. 4, 1956, p. 159. [Up to 7 March 1956, 433 specimens of *Plectrophenax nivalis* have been ringed at Spurn Head Observatory, Yorkshire, England.]
- BENINGTON, ARNOLD, and others. Photographic studies of some less familiar birds, LXXII, by Arnold Benington, F. S. R. Cerey and A. J. Sears. *British Birds*, Vol. 49, No. 8, 1956, p. 310-12, illus. [*Falco rusticolus* in Iceland.]
- BAKER, ROLLIN H., and FINDLEY, JAMES S. Mammals from southeastern Alaska. *University Of Kansas Publications, Museum of Natural History*, Vol. 7, No. 5, 1954, p. 473-77. [Description of specimens collected 1951.]
- MILLER, RICHARD S. A survey of the mammals of Bylot Island, Northwest Territories. *Arctic*, Vol. 8, No. 3, 1955, p. 166-76, illus., map. [Based on field observations, 1954, and other data.]
- BANFIELD, A. W. F. Tularemia in beavers and muskrats, Waterton Lakes National Park, Alberta, 1952-53. *Canadian Journal of Zoology*, Vol. 32, No. 3, 1954, p. 139-43, illus., maps. [Course of outbreak; possible origin.]
- MUSACCHIA, X. J. Cannibalism and other observations of captive ground squirrels. *Journal of Mammalogy*, Vol. 35, No. 3, 1954, p. 445-47. [*Citellus parryi parryi* from Fairbanks, Alaska, 1950.]
- OMURA, HIDEO, and NEMOTO, TAKAHISA. Sei whales in the adjacent waters of Japan. 3. Relation between movement and water temperature of the sea. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 10, 1955, p. 79-87, maps. [Habitats of *Balaenoptera borealis* and of *Balaenoptera brydei* distinguished.]
- FUJINO, KAZUO. On the body weight of the Sei whales located in the adjacent waters of Japan. 2. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 10, 1955, p. 133-411. [Weights of 20 Sei Whales (*Balaenoptera brydei*) from Bonin waters 1950, compared with *Balaenoptera borealis*.]
- [WHALES : EXHIBITIONS.] Hval på utstilling. *Norsk Hvalfangst-Tidende*, Árg. 43, Nr. 8, 1954, p. 457-59. [Exhibitions of whales. In Norwegian and English.]
- OHTA, KEIZO, and others. Composition of Fin whale milk, by Keizo Ohta, Toshinao Watarai, Tetsu Oishi, Yukio Ueshiba, Shinichi Hirose, Tōru Yoshizawa, Yaeko Akikusa, Michio Satō and Hideko Okano. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 10, 1955, p. 151-67, illus. [Biochemical analysis; comparison with human and cow's milk.]
- FUJINO, KAZUO. On the serological constitution of the Sperm- and Baird beaked-Whales. 1. Blood groups of the Sperm- and Baird beaked-Whales. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 9, 1954, p. 105-20. [Classification of blood groups.]
- NISHIWAKI, M. On the sexual maturity of the antarctic male sperm whale (*Physeter catodon* L.). *Scientific Reports of the Whales Research Institute* (Tokyo), No. 10, 1955, p. 143-49. [Results of examination of 961 whales captured 1951-52.]
- OGAWA, TEIZO. On the musculature of the sinus venosus and its continuation with the so-called conducting system of the whale's heart. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 9, 1954, p. 11-35, illus. [Odontoceti.]
- UDA, MICHITAKA. Studies of the relation between the whaling grounds and the hydrographical conditions. 1. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 9, 1954, p. 179-87, maps. [Off Japan.]

- BUDKER, PAUL. Sur l'étymologie du mot "Rorqual". *Mammalia*, Tome 18, No. 3, 1954, p. 257-61. [Discussion.]
- CHITTLEBOROUGH, R. G. Aspects of reproduction in the male humpback whale, *Megaptera nodosa* (Bonnaterre). *Australian Journal of Marine and Freshwater Research*, Vol. 6, No. 1, 1955, illus. [Criteria of sexual maturity.]
- CHITTLEBOROUGH, R. G. Puberty, physical maturity, and relative growth of the female humpback whale, *Megaptera nodosa* (Bonnaterre), on the western Australian coast. *Australian Journal of Marine and Freshwater Research*, Vol. 6, No. 3, 1955, p. 315-27. [Discusses relationship between phases of puberty and sexual maturity.]
- CHITTLEBOROUGH, R. G. Studies on the ovaries of the humpback whale, *Megaptera nodosa* (Bonnaterre), on the western Australian coast. *Australian Journal of Marine and Freshwater Research*, Vol. 5, No. 1, 1954, p. 35-63, 6 plates. [Variations in ovary weight during different phases of reproductive cycle recorded.]
- NISHIWAKI, MASAHARU, and others. On the sexual maturity of the Sei whale of the Bonin waters, by Masaharu Nishiwaki, Takashi Hibiya and Seiji Kimura. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 9, 1954, p. 165-77. [*Balaenoptera brydei*.]
- OMURA, HIDEO, and FUJINO, KAZUO. Sei whales in the adjacent waters of Japan. 2. Further studies on the external characters. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 9, 1954, p. 89-103, illus., map. [Further investigation of baleen plates and ventral grooves differentiating northern from southern Sei Whales (*Balaenoptera*).]
- FUJINO, KAZUO. On the body proportions of the Fin Whales (*Balaenoptera physalus* (L)) caught in the northern Pacific Ocean. 1. Preliminary report. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 9, 1954, p. 121-63, map. [Measurements listed and analysed.]
- RUUD, JOHAN T. The mortality rates of antarctic fin whale stocks. *Papers in Marine Biology and Oceanography*, Vol. 3, Deep-Sea Research Supplement, 1955, p. 257-60, illus.
- YAMADA, MUNESATO. Some remarks on the pygmy sperm whale, *Kogia*. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 9, 1954, p. 37-58, plate, illus. [Anatomy of 23 specimens.]
- OMURA, HIDEO, and others. Beaked whale *Berardius bairdi* of Japan, with notes on *Ziphius cavirostris*, by Hideo Omura, Kazuo Fujino and Seiji Kimura. *Scientific Reports of the Whales Research Institute* (Tokyo), No. 10, 1955, p. 89-132, illus., map. [Mating time, growth, external characteristics, teeth. Includes analysis of catch according to sex.]
- POPOV, YU. N. Nakhodki iskopyayemykh zhivotnykh v vechnoy merzloty [Discoveries of fossil animals in permafrost]. *Priroda* [Nature] (Moscow), 1956, No. 9, p. 40-48, illus., map. [Historical survey of discovery of mammoth and rhinoceros remains in Soviet Arctic.]
- TARASOV, M. P. O nekotorykh osobennostyakh morfologii severnogo olenya kak zhivotnogo tundry [Some peculiarities of the reindeer as a tundra animal]. *Byulleten' Moskovskogo Obshchestva Ispytateley Prirody. Novaya Seriya. Otdel Biologicheskiiy* [Bulletin of the Moscow Society of Naturalists. New Series. Biological Section], Tom 61, Vypusk 4, 1956, p. 80-82. [Evolution of reindeer hooves and antlers.]
- KROG, HILDUR, and MONSON, MILDRED. Notes on the metabolism of a mountain goat. *American Journal of Physiology*, Vol. 178, No. 3, 1954, p. 515-16. [Experiments with *Oreamnos americanus* Blainville in Alaska.]
- KENYON, KARL W., and SCHEFFER, VICTOR B. The seals, sea-lions, and sea otter of the Pacific coast. Descriptions, life history notes, photographs and drawings. *United States Department of the Interior Fish and Wildlife Service, Circular*, 32, [ii], 34 p. illus. [Revision of Wildlife Leaflet 334, 1953. Aids to identification.]
- TROITZKY, A. Contribution à l'étude des Pinnipèdes à propos de deux Phoques ramenés de croisière par S.A.S. le Prince Rainier III de Monaco. *Bulletin de l'Institut Océanographique*, No. 1032, Septembre 1953, 46 p. illus. (Reprint.) [Detailed study of anatomy and taxonomy of seals captured off Corsica. Cross between *Monachus albiventer* Bood and *Phoca groenlandica* Erxleben.]
- OLSEN, O. WILFORD. A Fur Seal pup is born. *Turton News* (Chicago, General Biological Supply House, Inc.), Vol. 35, No. 1, 1957, p. 32, illus. [Photograph of birth of *Callorhinus ursinus*, Pribilof Islands, with accompanying note.]
- RAND, ROBERT W. The Cape fur seal *Arctocephalus pusillus* (Schreber); its general characteristics and moult. *Commerce and Industry* (Pretoria), June 1956, 52 p. illus., maps (Reprinted as Division of Fisheries Investigational Report No. 21.) [Study of *Otaridae* from Sinclair Island, South West Africa, and elsewhere.]
- BACKHOUSE, K., and HEWER, H. R. Delayed implantation in the Grey Seal *Halichoerus grypus* (Fab.) *Nature*, Vol. 178, No. 4532, 1956, p. 550, illus. [Uterus of Grey Seal cow killed on Pembrokeshire coast, January 1956.]
- RAND, ROBERT W. Notes on the Marion Island Fur Seal. *Proceedings of the Zoological Society of London*, Vol. 126, Part 1, 1956, p. 65-82, illus., map. [*Arctocephalus gazella* studied 1951-52.]

- STOTT, KEN, jr. Northern Fur Seal ashore in San Diego, California. *Journal of Mammalogy*, Vol. 35, No. 2, 1954, p. 258. [*Callorhinus ursinus*, 1953.]
- RAND, ROBERT W. Reproduction in the female Cape Fur Seal, *Arctocephalus pusillus* (Schreber). *Proceedings of the Zoological Society of London*, Vol. 124, Part 4, 1955, p. 717-40, illus. [Based on observations and material from islands off western and southern South Africa.]
- DUNBAR, MAXWELL JOHN. The status of the Atlantic walrus, *Odobenus rosmarus* (L), in Canada. *Arctic Circular*, Vol. 8, No. 1, 1955, p. 11-14. [Present decline; possible remedies.]
- SCHILLER, EVERETT L. Unusual walrus mortality on St. Lawrence Island, Alaska. *Journal of Mammalogy*, Vol. 35, No. 2, 1954, p. 203-10, illus., map. [Investigations of 200 dead walruses (*Odobenus rosmarus*) washed ashore 1951. Probably killed by explosion off north east Siberia.]
- CHAPSKIY, K. K. Opyt peresmotra sistemy i diagnostiki tyuleney podsemeystva Phocinae [Attempt to review the system and diagnostics of seals of the sub-family Phocinae]. *Trudy Zoologicheskogo Instituta* [Transactions of the Zoological Institute], Tom 17, 1955, p. 160-99, illus. [New classification of systematics.]
- BOYD, J. MORETON. Grey Seal cows attending young away from the breeding grounds. *Scottish Naturalist*, Vol. 67, 1955, p. 125-26. [*Halichoerus grypus*.]
- HICKLING, GRACE, and others. The Grey Seals of the Farne Islands. A report on the work of the 1955 season, by Grace Hickling, Arthur W. Jones and Ian M. Telfer. *Transactions of the Natural History Society of Northumberland, Durham and Newcastle upon Tyne* (New Series), Vol. 11, No. 9, 1956, p. 230-34. [Progress report on investigations of *Halichoerus grypus*.]
- KAY, G. T. The young Grey Seal. *Scottish Naturalist*, Vol. 68, No. 1, 1956, p. 60-62. [First entry into water of *Halichoerus grypus* and learning to swim.]
- MATTHEWS, L. HARRISON. Marine mammals of west Wales. *Nature in Wales*, Vol. 1, No. 2, 1955, p. 49-56. [*Halichoerus grypus* and Cetacea found off west coast.]
- CHAPSKIY, K. K. K voprosu ob istorii formirovaniya kaspyskogo i baykalskogo tyuleney [On the history of origin of the Caspian and Baykal seals]. *Trudy Zoologicheskogo Instituta* [Transactions of the Zoological Institute], Tom 17, 1955, p. 200-16, illus. [New hypothesis of manner and date of appearance of seals in both areas.]

MEDICAL SCIENCES

- RIVOLIER, JEAN. *Médecine et montagne. Préface de Lucien Devies*. Paris, Arthaud, [c1956]. 203 p., illus. 21½ cm. [Manual of mountaineering from a physiological point of view: altitude, equipment, training, pathology, etc.]
- BROWN, D. K. Vitamin, protein and carbohydrate content of some arctic plants from the Fort Churchill, Manitoba, region. *Defence Research Northern Laboratory*, DRNL Technical Paper, No. 23, 1954, [iii], 12 p. [Monthly analyses for Black Spruce (*Picea mariana* L.) and twelve other common edible plants.]
- SMART, M. R., and BROWN, A. W. A. Studies on the responses of the female *Aedes* mosquito. Part 7. The effect of skin temperature, hue and moisture on the attractiveness of the human hand. *Bulletin of Entomological Research*, Vol. 47, Part 1, 1956, p. 89-100, plate, tables.
- TWINN, C. R. Review of recent progress in mosquito studies in Canada. *Mosquito News*, Vol. 15, No. 4, 1955, p. 195-203. [Work done on control of *Aedes* since 1948.]
- WRIGHT, R. H. Physical basis of insect repellency. *Nature*, Vol. 178, No. 4534, 1956, p. 638, illus. [Tests on 6241 chemicals to determine physical basis of mosquito repellency.]
- McCANCE, R. A., and others. *The hazards to men in ships lost at sea, 1940-44, by R. A. McCance, C. C. Ungley, J. W. L. Crosfill and E. M. Widdowson*. London, H.M.S.O., 1956. vi, 44 p. tables. 24½ cm. 5s. 0d. (Medical Research Council, Special Report Series, No. 291.) [Analysis of physiological aspects of survival at sea.]

ENGINEERING AND TECHNOLOGY. TRANSPORT ENGINEERING

- [SWEDEN : IRON MINING.] *Malm : Grängesbergskoncernen i bild*. Stockholm, Nordisk Roto-gravtry, 1953. 140 p. illus. 28½ cm. 24 Sw. Kr. [Brief account of history and present state of the Grängesbergskoncern's iron ore mining at Kiruna and Malmberget, north Sweden; over 100 pages of photographs.]
- SHVETSOV, P. F., and MEYSTER, L. A. Dozhdeval'no-infil'tratsionnyy sposob protaivaniya rossypey, kak odin iz priyemov gidrotermicheskoy melioratsii merzlykh gornykh porod [Sprinkling-infiltration method of thawing deposits, as a method of hydrothermal

- improvement of frozen rocks]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 6, p. 79-84, illus. [New method of thawing superficial deposits by sprinkling water on them.]
- BUCHER, EDWIN. Contribution to the theoretical foundations of avalanche defense construction. Beitrag zu den theoretischen Grundlagen des Lawinenverbau. Translated by Jan C. Van Tienhoven. *S[now] I[ce and] P[ermafrost] R[esearch] E[stablishment] Translation* 18, 1956, viii, 109 p. illus. [Theoretical contribution to prevention of avalanches; various types of snow and their properties; statics and dynamics of snow cover; methods of preventing avalanches. Swiss ed. pub. Bern, 1948.]
- GERBER, ERNST, and ROHRER, ERNST. Wesen und Wirkung der Staublawine. *Die Alpen*, Jahrg. 32, No. 3, 1956, p. 52-57, illus. [Character and effects, principally as regards human life, of "Staublawinen" (snow dust avalanches); two articles by separate authors under the same title.]
- [AVALANCHES.] *Avalanche handbook*. Washington, D.C., U.S. Department of Agriculture, Forest Service, 1953. iv, 146 p., illus. 26 cm. [Causes and protective measures for the layman.]
- [AVALANCHE DEFENCES : TERMINOLOGY.] Nomenclature des termes techniques pour les travaux de défense contre les avalanches. Publiée à la demande de la Commission suisse pour l'étude de la neige et des avalanches. *La Forêt* (Neuchâtel), 1953, No. 3; 1954, No. 4, 12 p. illus. (Reprint.) [Illustrated glossary of avalanche defence terms.]
- HAY, R. F. M. Ice accumulation on trawlers in northern waters. *Meteorological Magazine*, Vol. 85, No. 1010, 1956, p. 225-29, table. [Physical discussion of loss of trawlers off Iceland, January 1955.]
- [SHIPS. BAFFIN.] Hydrographic survey vessel for the Canadian Hydrographic Service. *Arctic Circular*, Vol. 8, No. 2, 1955, p. 23-27. [Particulars of *Baffin*, now under construction, built to navigate in ice.]
- STENVAAG, O., and GARBERG, A. Hvalbåters stabilitet under fart. *Tekniske Skrifter* (Oslo), Nr. 10 N, 1954, 14 p. illus. [Experiments with models on stability of whale catchers. English summary.]

AGRICULTURE. FORESTRY. HORTICULTURE

- JOHNSON, HUGH A., and STANTON, KEITH L. *Matanuska Valley memoir; the story of how one Alaskan community developed*. Palmer, University of Alaska, Alaska Agricultural Experiment Station, 1955. iv, 118 p. illus. 27 cm. (Bulletin 18.) [Agricultural development of this area past and present.]
- BUNT, T. S., and TCHAN, Y. T. Estimation of protozoan populations in soils by direct microscopy. *Proceedings of the Linnean Society of New South Wales*, Vol. 80, Pt. 2, 1955, p. 148-53. [Technique; includes analysis of Macquarie Island peat soil.]
- SMITH, J. Some moving soils in Spitsbergen. *Journal of Soil Science*, Vol. 7, No. 1, 1956, p. 10-21, illus., map. [Soil survey of area in Vestspitsbergen, by Aberdeen Spitsbergen Expedition, 1954.]
- ARTEM'YEV, G. V. Elektrovetokul'tura ovoshchey v zapolyar'ye [Culture of vegetables by electric light in the polar regions]. *Priroda* [Nature] (Moscow), 1956, No. 9, p. 100-02, illus. [Methods used in Soviet Arctic.]
- LUTZ, H. J. *Ecological effects of forest fires in the interior of Alaska*. Washington, D.C., U.S. Department of Agriculture, 1956. 119 p. illus., map. 23 cm. (Technical Bulletin No. 1133.) [Based on field work carried out 1949-52.]

DOMESTIC ANIMALS. LIVESTOCK

- UTSI, MIKEL N. P. Medel för att skydda renar mot korm och näsflugor. *Samefolkets Egen Tidning*, Årg. 37, Nr. 4, 1955, p. 10. [Method of protecting reindeer against flies by spray-gun.]
- SWEETMAN, WILLIAM J., and BRANTON, C. IVAN. *Getting a start in dairying in Alaska*. Palmer, Alaska Agricultural Experiment Station, 1955. 20 p. illus. 21½ cm. (Bulletin 19.) [Hints for prospective dairymen.]
- WHITAKER, IAN. Rasjonalisering av reindriften. *Sameliv*, 1953-1955 (pub. 1955), p. 16-20. [Respective merits of "intensive" and "extensive" reindeer husbandry (based on studies in Swedish Lapland, 1950-55).]
- HALLSJØ, ARNE. Retningslinjer i reindriften. *Sameliv*, 1953-1955 (pub. 1955), p. 36-44. [Recommendations for increasing profit of reindeer husbandry in Norway.]
- PAVEL, HJALMAR. Oversikt over reglene om erstatning for skade voldt av rein i Finnmark. *Sameliv*, 1953-1955 (pub. 1955), p. 109-21. [Analysis of regulations governing compensation for damage caused by reindeer in Finnmark, north Norway.]

FEDOROVA, O. A. Kormovyye ratsiony dlya transportnykh oleney pri skudnykh zapasakh yagelya na pastbishchakh [Fodder rations for transport reindeer when reindeer moss is scarce on the pastures]. *Byulleten' Nauchno-Tekhnicheskoy Informatsii Nauchno-Issledovatel'skogo Instituta Polyarnogo Zemledeliya*. . . [Bulletin of Scientific and Technical Information of the Research Institute of Polar Agriculture. . .], No. 1, 1956, p. 7-8. [Six diets used experimentally in Murmansk region.]

HUNTING. FISHING

AYUSHIN, BUDDA NIKOLAYEVICH. *Razvedka sel'di v severnoy chasti Okhotskogo morya* [Searching for herring in the northern part of the Sea of Okhotsk]. [Voroshilov], Primorskoye Knizhnoye Izdatel'stvo [Primorskiy Kray Book Publishing House], 1956. 52 p. illus. 20 cm. [Currently used methods of locating and evaluating herring shoals.]

WHALING AND SEALING INDUSTRIES

ALDEN, W. G., and others. Condensed whale solubles. The evaluation of this by-product of the whaling industry when fed as the animal protein supplement to the rations of pigs and poultry, by W. G. Alden, R. M. Sangster and M. D. Jones. *Journal of Agriculture*, November 1954, p. 158-61.

BRUUN, SVEND FOYN. *Hvalfangerselskapet "Pelagos" A/S 1928-30. juni-1953. Et tilbakeblikk*. Tønsberg, Tønsbergs Aktietrykkeri, 1953. 32 p. 29½ cm. [Brief history of Norwegian whaling company "Pelagos" A/S, 1928-53.]

GJESSING, GUTORM. Litt om sjøsamisk sel- og kvalfangst i gammel tid. *Sameliv*, 1953-1955 (pub. 1955), p. 21-35. [Sealing and whaling by sea Lapps of Finnmark, north Norway (mainly 17th and 18th centuries).]

MATTHEWS, L. HARRISON. Zoological Society of London; exhibition of whales and whaling. *Nature*, Vol. 175, No. 4466, 1955, p. 970-71. [Description of exhibits, May 1955.]

NORDENSWAN, MARIANNE. Den norska valfångstens utveckling under de senaste decennierna. *Nordenskiöld-Samfundets Tidskrift*, Arg. 15, 1955, p. 43-55, illus. [Development of Norwegian whaling industry during recent decades (mainly Antarctic): comparison with other nations.]

TRANSPORT AND POSTAL SERVICES

[NORWAY: RAILWAY TRANSPORT.] *Stambanen gjennom Nord-Norge*. Tromsø, Peder Norbye, [1954]. 28 p. 22½ cm. [Petition to Norwegian parliament by railway committees of Nordland and Troms on building of line through north Norway. Supported by statistics.]

[PHILATELY: ARCTIC.] Stamps of the north. *Arctic Circular*, Vol. 8, No. 2, 1955, p. 28-31, illus. [Issues of arctic interest.]

FOOD INDUSTRIES. FOOD PRESERVATION

HERVEY, G. R., and McCANCE, R. A. Emergency rations. *Proceedings of the Nutrition Society*, Vol. 13, No. 1, 1954, p. 41-45. [Physiological principles; three rations discussed.]

LEATHER INDUSTRY. SKINS AND FURS

RICH, EDWIN ERNEST. Russia and the colonial fur trade. *Economic History Review*, Vol. 7, No. 3, 1955, p. 307-28. [Russia's part in North American fur trade in late 17th century.]

BUILDING CONSTRUCTION

PIHLAINEN, J. A. *Permafrost and buildings*. Ottawa, National Research Council, Division of Building Research, 1953. 27 p. illus., 18 cm. 10 c. (Better Building Bulletin No. 5.) [Outlines problems arising when building on frozen ground.]

VOYTKOVSKIY, K. F. *Raschet sooruzheniy iz l'da i snega* [Computing buildings made of ice and snow]. Moscow, Izdatel'stvo Akademii Nauk SSSR [Publishing House of the Academy of Sciences of the U.S.S.R.], 1954. 136 p. illus. 22 cm. [Mechanical properties of ice and snow calculated for constructional purposes.]

- [HEATING OF BUILDINGS.] *Basic design temperatures for space heating by a study committee convened by the councils of the Institution of Mechanical Engineers, the Institution of Electrical Engineers, the Institution of Gas Engineers and the Institution of Heating and Ventilating Engineers.* London, H.M.S.O., 1955. vi, 89 p. tables. 24½ cm. 3s. 6d. (Post War Building Studies No. 33.) [Study of external air temperature and its maximum duration as a basis for design of heating systems.]
- [CONDENSATION IN BUILDINGS.] *Condensation control in buildings as related to paints, paper and insulating materials.* Washington, D.C., National Research Council, Building Research Advisory Board, 1952. ii, 118 p. illus. 28 cm. \$3.50. (BRAB Research Conference Report No. 4.) [Current research.]

THE ARTS. ARCHITECTURE. ENTERTAINMENT. RECREATION

- VOILLAT, ADRIEN. Nouveaux crampons à pointes profilées en étoile. *Die Alpen*, Jahrg. 32, No. 7, 1956, p. 189-90, illus. (facing *Varia* p. 117). [Details of new design.]
- BAIRD, PATRICK D. An ascent in Baffin Island. *Canadian Alpine Journal*, Vol. 37, 1954, p. 31-33, illus. [The "Queen" mountain, 1953.]
- BROWNE, BELMORE. *The conquest of Mt. McKinley. Illustrations by Belmore Browne and Bradford Washburn.* Boston, Mass., Houghton Mifflin Company, 1956. xxxii, 381 p. illus., maps (on end papers). 21 cm. [Author's expeditions to Mount McKinley, Alaska 1906 and 1910.]

EXPEDITIONS. HISTORY OF EXPLORATION

- HEYERDAHL, THOR, and others. *Great Norwegian expeditions, by Thor Heyerdahl, Søren Richter and Hj. Riiser-Larsen.* Oslo, Dreyers Forlag, 1954? 232 p. illus., ports., maps 27 cm. [Nansen (*Fram* expedition, 1893-96), Sverdrup (second *Fram* expedition, 1893-1902), Amundsen (*Gjøa* and South Pole expeditions); aircraft in polar exploration.]
- MALAURIE, JEAN. L'activité géographique française dans les régions polaires (1940-1955). In: *La Géographie française au milieu du XX^e siècle* (Paris, J. B. Baillière), 1956, p. 261-80. [Work by French scientists and explorers: gives references to and summaries of published results.]
- SKELTON, R. A. Explorers' maps. 14. The polar regions in the 19th century. *Geographical Magazine*, Vol. 24, No. 4, 1956, p. 187-200, illus., maps. [Progress of exploration illustrated by contemporary charts.]
- [CANADIAN ARCTIC : EXPLORATION.] Canadian Government work in the north. *Arctic Circular*, Vol. 8, No. 1, 1955, p. 14-16. [Names of present departments and personnel and their areas of work.]
- NICHOLSON, NORMAN L. The contribution of explorers to the mapping of arctic north America. *Canadian Surveyor*, Vol. 11, No. 4, 1953, p. 13-18. [History.]
- SKELTON, R. A. Explorers' maps. 12. North America from sea to sea, 1600-1800. *Geographical Magazine*, Vol. 28, No. 10, 1956, p. 489-501, maps. [Includes 18th century exploration in North American Arctic.]
- BADIGIN, K. S. *Po studenym moryam [In icebound seas]*. Moscow, Gosudarstvennoye Izdatel'stvo Geograficheskoy Literatury [State Publishing House for Geographical Literature], 1956. 424 p. illus., maps. 20½ cm. [Arctic voyages by Russians, 12th-17th centuries.]
- PRIESTLEY, SIR RAYMOND E. Twentieth-century man against Antarctica. *Advancement of Science*, Vol. 13, No. 50, 1956, 16 p. (Reprint.) [Presidential address to British Association, Sheffield, 29 August 1956. Also published in *Nature*, Vol. 178, No. 4531, 1956, p. 463-70.]

Arctic

- GREKOV, V. I. Naiboleye ranneye pechatnoye izvestiye o pervoy kamchatskoy ekspeditsii (1725-1730 gg.) [The earliest printed account of the first Kamchatka expedition (1725-30)]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya [News of the Academy of Sciences of the U.S.S.R. Geographical Series]*, 1956, No. 6, p. 108-12. [Significance of article in *Sanktpeterburgskkiye Vedomosti* of 16 March 1730.]
- GIBBONS, RUSSELL W. *An historical evaluation of the Cook-Pearry controversy; a critique of the acceptance by history and reference works of the claims of Robert Edwin Peary against those of Frederick Albert Cook as to the discovery of the North Pole, 1908-09.* [Ada, Ohio, P.O. Box 44], Russell W. Gibbons, 1956. [126] leaves. 26 cm. [Supports claims of Cook.]
- KOCH, LAUGE, and others. Report on the expeditions to central east Greenland 1926-33 conducted by Lauge Koch: Part II by Lauge Koch, H. G. Backlund, David Malmqvist, Olof Eklund, Heinrich Büttler, E. Wegmann, G. Säve-Söderbergh, Eigil Nielsen

- H. Stauber, A. Vischer, Malthe Andersson, W. Bierther, Holger Leth Pedersen, A. Schwarck, P. V. Glob and Thorv. Sørensen. *Meddelelser om Grønland*, Bind 143, Nr. 2, 1955, 642 p. illus., maps. [Mainly geological expeditions: detailed narrative; p. 1-299 by leader; p. 301-642 by members of expeditions. Special reports on motorboats, p. 256-65; provisions, p. 266-73; ponies, p. 274-77; radio, p. 278-83; houses, p. 284-99.]
- VICTOR, PAUL-EMILE. Wringing secrets from Greenland's icecap. *National Geographic Magazine*, Vol. 109, No. 1, 1956, p. 120-47, illus., map. [Leader's account of work of Expéditions Polaires Françaises, 1947-53.]
- HATTERSLEY-SMITH, GEOFFREY. Northern Ellesmere Island. *Geographical Journal*, Vol. 122, Part 1, 1956, p. 13-24, illus., map. [Leader's narrative of 1953 and 1954 expeditions of Canadian Defence Research Board.]
- MANNING, THOMAS. Defence Research Board's 1953 Banks Island expedition. *Arctic Circular*, Vol. 7, No. 2, 1954, p. 11-15, map. [Narrative.]
- COLLINS, HENRY B. Archaeological work on Southampton and Coats Islands. *Arctic Circular*, Vol. 8, No. 1, 1955, p. 2-5. [Leader's account of 1954 expedition.]
- COOPER, PAUL F. A trip to King William Island in 1954. *Arctic Circular*, Vol. 7, No. 1, 1955, p. 8-11, maps. [Narrative.]
- DESGOFFE, CLAUDE. An anthropological survey of the Belcher Islands. *Arctic Circular*, Vol. 8, No. 2, 1955, p. 19-23. [By author, 1954.]
- CHRISTIE, R. L. Northern Ellesmere ice shelf expedition, 1954. *Arctic Circular*, Vol. 8, No. 1, 1955, p. 5-8. [Narrative.]
- EYFÖRSSON, JÓN. Vatnajökulsföör 1955. *Jökull*, ÁR 5, 1955, p. 23-27, illus. [Icelandic glaciological expedition to Vatnajökull, May-June 1955.]
- EYFÖRSSON, JÓN. Vatnajökulsföör í sept. 1955. *Jökull*, ÁR 5, 1955, p. 41-42. [Icelandic glaciological expedition to Vatnajökull, September 1955.]
- ÞÓRARINSSON, SIGURÐUR. Mælingaleiðangurinn á Vatnajökli vorið 1955. *Jökull*, ÁR 5, 1955, p. 27-29, illus. [Icelandic expedition to measure glacier thicknesses on Vatnajökull, 1955.]
- MAKSIMOV, IGOR' VLADISLAVOVICH. Vtoraya morskaya antarkticheskaya ekspeditsiya Akademii Nauk SSSR [Second marine antarctic expedition of the Academy of Sciences of the U.S.S.R.]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 6, p. 140-41. [Plans for oceanographical work in Southern Ocean in Ob', 1957.]

Antarctic

- LAW, PHILIP. Australian National Antarctic Research Expedition, 1955. *Geographical Journal*, Vol. 122, Part 1, 1956, p. 31-39, map. [Leader's account.]
- HOLDGATE, MARTIN W., and others. The Gough Island Scientific Survey, 1955-56, by M. W. Holdgate, R. W. LeMaitre, M. K. Swales and N. M. Wace. *Nature*, Vol. 178, No. 4527, 1956, p. 234-36. [Outline of scientific results.]
- SAFFERY, J. H. Falkland Islands Dependencies aerial survey expedition. *Shell Aviation News*, No. 219, 1956, p. 2-7, illus., map. [Outline of work completed by Hunting Aero-surveys Ltd. during 1955-56 season.]
- TRESHNIKOV, A. F. Sovetskiye issledovaniya na antarkticheskoy kontinente v 1957 godu [Soviet investigations on the antarctic continent in 1957]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 6, p. 139-40. [Leader of relief party outlines plans.]
- ZHIVAGO, A. V., and LISITSYN, A. P. V glubinakh antarkticheskikh morey [In the depths of antarctic seas]. *Nauka i Zhizn'* [Science and Life], 1956, No. 12, p. 21-24, illus. [Oceanographical cruise of Ob' in Southern Ocean, 1955-56.]

BIOGRAPHY

- NISSEN, KRISTIAN. Matti Aikio: en norsk forfatter av samisk ætt. *Sameliv*, 1953-1955 (pub. 1955), p. 75-83, port. [Biography of Norwegian Lapp author (1872-1929).]
- CORBEL, JEAN. Claude Dumont-Desgoffe. *Revue Canadienne de Géographie*, Vol. 9, Nos. 2-3, 1955, p. 132-34. [Obituary of French Eskimo scholar.]
- FREUCHEN, PETER. *Fremdeles frimodig*. København, Gyldendal, 1955. 236 p. 23½ cm. 19.75 D. Kr. [Second part of autobiography.]
- TIGERSTRÖM, HARALD. Petrus Laestadius—kulturkämpe i Lappmarken. *Norrbotnen*, 1955, p. 85-138, illus. [Biography of missionary among north Swedish Lapps (1802-41); history of family.]
- MIKKELSEN, EJNAR. *Farlig tomandsfærd*. Copenhagen, Gyldendal, 1955. 189 p. illus., port., map. 24 cm. 21.75 D. Kr. [Second volume of autobiography: Alabama expedition to north-east Greenland, 1909-12.]

- LANTIS, MARGARET. Edward William Nelson. *Anthropological Papers of the University of Alaska*, Vol. 3, No. 1, 1954, p. 4-16, port. [1855-1934. Biography. Evaluation of his work.]
- STAFFORD, Mrs MARIE PEARY. The Peary flag comes to rest. *National Geographic Magazine*, Vol. 106, No. 4, 1954, p. 518-32, illus. [Story of "Stars and Stripes" presented in 1955 to National Geographic Society.]
- CHERNENKO, M. B., ed., and others. *Puteshestviya i issledovaniya leytenanta Lavrentiya Zagoskina v russkoy Amerike v 1842-1844 g.g.* [Travels and investigations of Lieutenant Lavrentiy Zagoskin in Russian America in 1842-44]. Edited by M. B. Chernenko, G. A. Agranat and Ye. E. Blomkvist. Moscow, Gosudarstvennoye Izdatel'stvo Geograficheskoy Literatury [State Publishing House for Geographical Literature], 1956. 455 p., illus., maps. 22½ cm. [Annotated edition of Zagoskin's narrative of travels in region of lower Kuskokwim and Yukon, and other papers of his; biographical sketch of Zagoskin.]

ARCTIC REGIONS IN GENERAL

- GRIGOR'YEV, A. A. *Subarktika. Opyt kharakteristiki osnovnykh tipov geograficheskoy sredy*. [The sub-Arctic. An attempt to characterise the basic types of geographical environment.] 2nd edition, revised and augmented. Moscow, Gosudarstvennoye Izdatel'stvo Geograficheskoy Literatury [State Publishing House for Geographical Literature], 1956. 224 p. maps. 23cm. [Climate, geomorphology, soil formation, flora and fauna, in eastern European sub-Arctic; variations found in other sub-Arctic areas.]
- [ARCTIC : SAILING DIRECTIONS.] *Instructions nautiques : Mers de Norvège, de Barentsz, Mer Blanche et Océan Arctique. Côtes de Norvège et URSS (de la presqu'île de Stadt au Détroit de Bering)*. Paris, Service Hydrographique de la Marine, 1955. xxiv, 438 p. maps. 23 cm. (No. 331 Série E (5).)

Greenland

- [GREENLAND : EDUCATION.] Den grønlandske skole 1953-54. *Beretninger vedrørende Grønland*, 1955, Nr. 6, 58 p. illus. [Official report on Greenland education, 1953-54.]
- [GREENLAND : PUBLIC HEALTH.] Sundhedstilstanden i Grønland: landslægens årsberetning 1953. *Beretninger vedrørende Grønland*, 1955, Nr. 4, 45 p. illus., map. [Public health in Greenland; annual report of chief medical officer, 1953. Partial English summary.]
- FREDERIKSEN, SVEND. Aspects of European influence in west-Greenlandic poetry. *Contribution of the Arctic Institute, The Catholic University of America, Washington, D.C.* Nr. A2, 1955, 15 p.
- HATT, GUDMUND. Early intrusion of agriculture in the North Atlantic subarctic [sic] region. *Anthropological Papers of the University of Alaska*, Vol. 2, No. 1, 1953, p. 51-107. [History of Norse and pre-historic colonisation and farming in Scandinavia, Lapland, Iceland, Faroes and Greenland. Bibliography.]
- SØRENSEN, JANUS. *Vejledning i elementær navigation og sømandsskab samt i kystsejlad vestgrønlandske farvande...* København, Bianco Luno, 1954. 275 p. illus., maps. 24½ cm. [Instruction book in elementary navigation and seamanship, and sailing directions for west Greenland coastal waters. In Danish and Greenlandic.]
- THOMASEN, BERTHEL. Brandværns inspektion på Grønlands veskyst 1955. *Beretninger vedrørende Grønland*, 1955, Nr. 5, 22 p. illus. [Official report on fire precautions in west Greenland, 1955.]

North American Arctic

- STONE, KIRK H. Human geographic research in the North American northern lands. *Arctic*, Vol. 7, Nos. 3-4, 1954, p. 321-35, maps. (Reprinted in Special Publication No. 2 of the Arctic Institute of North America, p. 209-23.) [Population and settlement. Includes estimate of 1951 population.]
- [CANADA : DEFENCE.] *Defence. Establishment of a distant early warning system. Agreement between Canada and the United States of America effected by exchange of notes signed Washington, May 5, 1955. In force May 5, 1955.* Ottawa, Queen's Printer, 1955. 15 p. (Canada. Treaty Series, 1955, No. 8.) [In English and French.]
- DENIS, PAUL-YVES. Les facteurs géographiques de la situation et du site de Whitehorse. *Revue Canadienne de Géographie*, Vol. 9, No. 4, 1955, p. 161-78, maps. [Yukon.]
- SCHERMAN, KATHARINE. *Spring on an arctic island*. Boston, Mass., Toronto, Little, Brown and Co., [c1956]. xviii, 331 p. illus., map (on end papers). 22 cm. [Author accompanied scientific expedition to Bylot Island, 1954. General description.]

- GADBOIS, PIERRE, and LAVERDIÈRE, CAMILLE. Esquisse géographique de la région de Floeberg Beach, nord de l'île Ellesmere. *Geographical Bulletin*, No. 6, 1954, p. 17-44, illus., map. [Structure and relief; soil structure; climate; glaciology; flora and fauna.]
- [QUEEN ELIZABETH ISLANDS.] The Queen Elizabeth Islands. *Arctic Circular*, Vol. 7, No. 2, 1954, p. 16-19, map. [Limits. History of exploration.]
- [ALASKA : POPULATION STATISTICS.] *Vital statistics of the United States 1953. Vol. 1. Introduction and summary tables for Alaska, Hawaii, Puerto Rico, and Virgin Islands. Marriage, divorce, natality, fetal mortality and infant mortality data.* Washington, D.C., U.S. Government Printing Office, 1955. ix, 354 p. tables. 29½ cm. \$3.50.
- [ALASKA : HARBOURS.] *Southeastern Alaska. Letter from the Secretary of the Army transmitting a letter from the Chief of Engineers. . . submitting an interim report. . . on a preliminary examination and survey of harbors in Alaska, with a view to determining the advisability of improvements in the interest of navigation, flood control, hydro-electric power, and related water uses. . .* Washington, D.C., U.S. Government Printing Office, 1954. xi, 116 p. maps. 23 cm. (83rd Congress, 2nd Session, 1954. House Document No. 501.)
- STANTON, WILLIAM J. *Alaska recreation survey. Part 1, Vol. 1: economic aspects of recreation in Alaska.* Washington, D.C., Dept. of the Interior, National Park Service, 1953. viii, 191 p. illus., map. 28 cm. [Compiled with aim of developing park and tourist facilities in Alaska.]
- [ALASKA : MAPS.] New Alaska map portrays a far-north frontier. *National Geographic Magazine*, Vol. 109, No. 6, 1956, p. 808, illus. [Issued with this number of National Geographic Magazine, scale 1:3,000,000, in colour.]
- BANK, TED, II. *Birthplace of the winds.* New York, Thomas Y. Crowell, 1956. xii, 274 p. illus., maps. 20½ cm. \$4.50. [Popular account of author's visit to Atka, Aleutian Islands, in 1948 for anthropological investigations.]

Soviet Arctic

- POLYAKOV, A. S. Razvitiye i razmeshcheniye proizvoditel'nykh sil rayonov Yevropeyskogo severa v shestoy pyatiletke i zadachi ekonomicheskoy geografii [Development and location of productive forces of regions of the European north in the sixth five-year plan and tasks of economic geography]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 6, p. 70-78. [Discussion as to how transport and mining should be developed in Komi A.S.S.R. and Arkhangel'skaya Oblast'.]
- POMUS, M. I. *Zapadnaya Sibir' (ekonomiko-geograficheskaya kharakteristika)* [Western Siberia (Characteristics of its economic geography)]. Moscow, Gosudarstvennoye Izdatel'stvo Geograficheskoy Literatury [State Publishing House for Geographical Literature], 1956. 644 p. illus., maps. 20½ cm. [Economic geography, by subject and region, of Ob'-Irtys' basin. Bibliography.]
- [SOVIET ARCTIC : SAILING DIRECTIONS.] *Sailing directions for the northern U.S.S.R. Vol. 2. Mys Kanin Nos to Ostrov Dikson, 1st ed.* Washington, D.C., Hydrographic Office, 1954. xxviii, 408 p. (loose leaf), illus., map (in end pocket). 26½ cm. (H.O. Pub. No. 137B.)
- [SOVIET ARCTIC : SAILING DIRECTIONS.] *Sailing directions for the northern U.S.S.R. Vol. 3. Ostrov Dikson to Mys Shmidt. 1st ed.* Washington, D.C., Hydrographic Office, 1954. xiv, 346 p. (loose leaf), illus., map (in end pocket). 26½ cm. (H.O. Pub. No. 137C.)
- UNTERBERGER, BETTY MILLER. *America's Siberian Expedition, 1918-1920: a study of national policy.* Durham, North Carolina, Duke University Press, 1956. 271 p. maps. 23½ cm. [History of United States intervention in eastern Siberia.]
- [KURIL'SKIYE OSTROVA.] Japan irredenta. *Economist*, Vol. 180, No. 5899, 1956, p. 726, map. [Historical background to Japanese claim from Soviet Union of Kunashiri and Etorofu as condition of signing peace treaty.]
- PASETSKIY, V. M., ed. *Dnevnyye zapiski P. K. Pakhtusova i S. A. Moiseyeva* [Diaries of P. K. Pakhtusov and S. A. Moiseyev]. Moscow, Gosudarstvennoye Izdatel'stvo Geograficheskoy Literatury [State Publishing House for Geographical Literature], 1956. 215 p. illus., maps. 22½ cm. [Annotated edition of diaries kept during exploration of Novaya Zemlya, 1832-39.]
- SLAVIN, S. V. Osobennosti Khozyaystvennogo razvitiya Yakutskoy ASSR, kak odnogo iz rayonov severa Aziatskoy chasti SSSR [Features of the economic development of Yakutskaya A.S.S.R. as one of the northern regions of the Asiatic part of the U.S.S.R.]. *Izvestiya Akademii Nauk SSSR. Seriya Geograficheskaya* [News of the Academy of Sciences of the U.S.S.R. Geographical Series], 1956, No. 2, p. 6-16. [Factors likely to influence general economic development of region.]

KOKOSOV, N. M., and others. *Khanty Mansiyskiy natsional'nyy okrug (oчерk prirody i khozyaystva)* [*Khanty-Mansiyskiy Natsional'nyy Okrug (Outline of its nature and economy)*]. By N. M. Kokosov, V. I. Nikulin and V. I. Kharin. Sverdlovsk, Akademiya Nauk SSSR. Ural'skiy Filial [Academy of Sciences of the U.S.S.R. Ural Branch], 1956. 104 p. illus., maps. 27 cm. [Physical and economic geography, based on field investigations made in 1950-52.]

Scandinavia (Denmark, Finland, Iceland, Norway and Sweden)

- [LAPLAND : TRAVEL GUIDE.] *Fjällturer i norra Lappland: andra reviderade upplagan*. Stockholm, Svenska Turistföreningens Förlag, 1954. 482 p. illus., maps. 17½ cm. 16 Sw. Kr. (STF:s Fjällturböcker.) [North Lapland (mainly Swedish): detailed guides to 79 routes; geography, animal and plant life, population, tourist facilities, equipment and survival, informative gazetteer. Authoritative.]
- LUNDGREN, SVANTE. *Off the beaten track: Sweden—north of the River Dal*. Stockholm, Nordisk Rotogravyt, 1952. 160 p. illus. 25½ cm. 28 Sw. Kr. [Descriptions of north Swedish Lapland. 107 photographs (mainly landscape and birds).]
- MELØY, L. LIND. *Etterskoling av ungdom som har tapt skolegang på grunn av krigen. Sameliv, 1953-1955* (pub. 1955), p. 56-70. [Further education of people in Finnmark, north Norway, who have missed schooling because of war.]
- SIMENSEN, S. *Harstad gjennom femti år 1903-1953*. Harstad, Harstad kommune, 1953. 239 p. illus., maps. 25½ cm. [History of Harstad, north Norway, 1903-53.]
- [TROMS.] *Troms. En statistisk-økonomisk analyse*. Tromsø, Arbeidsdirektoratet, [1954]. 143 p. illus., maps. 30 cm. 5 N. Kr. [Statistical, demographic and economic analysis of Troms fylke, Norway.]

ANTARCTIC REGIONS

- GANDÍA, ENRIQUE DE. Una nueva doctrina sobre la Antártida. *Revista Geográfica Americana* (Buenos Aires), Año 23, Vol. 45, 1956, No. 238, p. 150-53, illus. [Sector principle, as applied in Arctic, not welcomed by Argentines in Antarctic.]
- [ANTARCTIC : SAILING DIRECTIONS.] *Suplemento No. 1 (1956) al Derrotero Argentino. Parte V: Antártida y archipiélagos subantárticos argentinos (2a. edición, 1953), actualizado hasta el 1 de Junio de 1956 (incluyendo folleto 11 de 1956)*. Buenos Aires, Ministerio de Marina, Dirección General de Navegación e Hidrografía, 1956. 153 p. illus., maps (one in end pocket). 27 cm. [Supplement to Argentine sailing directions of 1953. Includes chart of Weddell Sea ice distribution, 1954-55.]
- [ANTARCTIC : SAILING DIRECTIONS.] *Supplement No. 4—1956 relating to the Antarctic Pilot, second edition, 1948, corrected to 9 April, 1956*. London, Hydrographic Department, 1956. 116 p. illus. 21½ cm.
- [ANTARCTIC : SAILING DIRECTIONS.] *Supplement to H.O. Pub. 138 Sailing directions for Antarctica (first edition 1943). Corrections and additions from date of publication (May 12 1943) to September 15, 1956, through N.M. 37 of 1956*. [Washington, D.C.], Hydrographic Office, 1956. [Includes table of distances between positions in Antarctica and selected ports. Also aids to identification of Cetacea.]
- CORDINI, I. RAFAEL. *Contribución al conocimiento del sector antártico argentino*. Buenos Aires, Instituto Antártico Argentino, 1955. vi, 277 p. illus., 57 plates, maps. 30 cm. (Instituto Antártico Argentino Publicación No. 1.) [General account of Falkland Islands Dependencies. Includes detailed section on floating ice. Annotated bibliography.]
- HAYTON, ROBERT D. The "American" Antarctic. *American Journal of International Law*, Vol. 50, No. 3, 1956, p. 583-610. [Review of dispute between Argentina, Chile and United Kingdom about sovereignty over Falkland Islands Dependencies; special reference to legal aspects.]
- TOMA, PETER A. Soviet attitude towards the acquisition of territorial sovereignty in the Antarctic. *American Journal of International Law*, Vol. 50, No. 3, 1956, p. 611-26. [Historical summary and comparison of Soviet legal arguments with classical theories of Western international lawyers.]
- ZAVATTI, SILVIO. Il nuovo limite australe dell'ecumene. *Bollettino della Società Geografica Italiana*, Vol. 7, N. 11-12, 1954, p. 497-504, map. [Emphasizes southward expansion and settlement in Antarctica. Includes list of British, Argentine and Chilean bases in Falkland Islands Dependencies, with dates of occupation. Reviewed by George Kish in *Geographical Review*, Vol. 46, No. 2, 1956, p. 295-97.]
- MALING, D. H. Recent Antarctic research. *Nature*, Vol. 178, No. 4537, 1956. [Outline of joint symposium held by Sections C (Geology) and E (Geography) of British Association, Sheffield, 4 September 1956.]
- PETTINGILL, OLIN SEWALL, jr. People and penguins of the faraway Falklands. *National Geographic Magazine*, Vol. 109, No. 3, 1956, p. 387-416, illus., map. [Author's visit to film birds for new Disney feature "Islands of the Sea".]

ERRATA

The *Polar Record*, No. 55, January 1957

Page 340, line 18. *For 2746 read 2744*

Page 340. The map should bear the acknowledgement "By courtesy of the Admiralty, Hydrographic Department."

Page 341, map. *For 2760 read 2744*

Page 342, line 20. *For So also are the lower basalts from read The lower basalts form*

Page 343, line 4. *After for insert pollen analysis and*

Page 343, line 16. *After brown insert and yellow*

Page 343, line 20. *For pusillus read gazalla*

Page 349, line 1. *For Universitet read Akademi*

Page 353, line 39. *For 32 read 24*

Page 353, line 54. *For 32 read 24*

Page 358, line 13. *For Myrnyy read Mirnyy*

Page 358, line 16. *For Norselon read Norsel*

Page 359, line 2. *For Cape Adare read Cape Hallett*

Page 360, line 8. *For "Operation Deepfreeze" I read "Operation Deepfreeze I"*

Page 377, line 16. *For Anmagssalik read Angmagssalik*

Page 378, line 7. *For kommuneståd read kommuneråd*

THIRTIETH ANNUAL REPORT OF THE COMMITTEE OF MANAGEMENT OF THE SCOTT POLAR RESEARCH INSTITUTE

2 November 1956

The Committee of Management of the Scott Polar Research Institute beg leave to report to the University on the work of the Institute for the year ending 31 July 1956:

Constitution. The constitutional status of the Institute and the route for its Treasury grant-in-aid have continued to be under review, and, after consultation with the Council of the Senate, the Committee of Management sent unanimous recommendations on these matters to the General Board.

Research, Information, and Advice. Activity by many nations in the Arctic and Antarctic has continued to increase. The forthcoming International Geophysical Year has led to an increased number of inquiries.

The chief line of research upon which the Institute has been concentrating is the changing distribution and behaviour of sea ice, and its underlying causes. Dr Armstrong has continued his general studies of sea ice, especially in the Soviet Arctic. Dr Swithinbank, under a contractual arrangement with the Defence Research Board in Ottawa, has been engaged since August 1955 on an ice probability analysis in Canadian Arctic waters. Mr J. A. Heap, of the Falkland Islands Dependencies Scientific Bureau (Colonial Office), has been working at the Institute since July 1955 on a similar study for the waters of the Falkland Islands Dependencies; he spent the southern summer of 1955–56 in the Antarctic. An "Illustrated ice glossary" was completed by Dr Armstrong and Dr Roberts, and published in January 1956 in the *Polar Record*.

Dr Swithinbank, a former member of the Norwegian–British–Swedish Antarctic Expedition, 1949–52, has almost completed his study of the morphology, régime, and movement of ice sheets and of the physiography of nunatak areas, based on his observations in western Dronning Maud Land, Antarctica, and the substance has been approved for the degree of D.Phil. (Oxon). Publication of this work is now in progress in Norway.

Dr Roberts has continued his work on Antarctic history, primarily as a basis for determining the place-names for cartographical purposes. He has completed an "Abstract of the Universal Decimal Classification for use in polar libraries". This constitutes a major revision of the schedules used in the Institute's library since 1945 to bring it into conformity with the latest decisions of the Fédération Internationale de Documentation at the Hague. In collaboration with the British Glaciological Society and the British Standards Institution he has also prepared new schedules for the classification of snow, ice, and frozen ground, and their relation to civil engineering. These proposals have been submitted to the Fédération Internationale de Documentation. The new classification provides the basis for an international exchange of bibliographic cards which the Institute is arranging with other polar organizations throughout the world.

Professor Duncan Stewart of Carleton College, Minnesota, worked at the Institute from February to May 1956 and completed a monograph on the petrology of antarctic rocks.

By special arrangement with the "Bibliography Project" of the Arctic Institute of North America, Mrs Sylva Gethin has throughout the year been abstracting Scandinavian literature,

Facilities were given to the Gough Island Scientific Survey, 1955-56, led by Mr J. B. Heaney and Dr M. W. Holdgate. A party of specialists spent from 13 November 1955 to 13 May 1956 investigating this sub-antarctic island.

Staff. Miss Burkinshaw resigned from her post as Assistant to the Director on 3 September 1955 and was succeeded by Miss A. N. Macdonald on 22 November 1955.

Miss E. A. Woodhouse joined the staff as temporary Library Assistant on 16 January 1956; her salary being met from the residue of an anonymous gift received three years ago.

Dr C. W. M. Swithinbank joined the staff as a Research Fellow on 1 August 1955. *Finance.* During the year the Institute received the following sums which are gratefully acknowledged.

H.M. Treasury grant-in-aid. The grant is now regularly received half-yearly in arrears instead of annually in arrears. The sum of £2625 was received on 13 February 1956 and £3250 on 11 July 1956.

Australia. A donation of £398. 16s. 1d. (£A500) authorized by the Australian Cabinet was received on 28 May 1956.

Falkland Islands Dependencies Administration. A seventh annual subvention of £100 was made by the Governor of the Falkland Islands and was received on 4 January 1956.

South Africa. A donation of £200 from the South African Government was received on 27 October 1955.

New Zealand. A grant of £100 sterling was received from the New Zealand Government on 11 August 1955.

Publications. Since the last Annual Report was published three numbers of the *Polar Record*, Nos. 51, 52, and 53, have been issued, a total of 297 pages. The Index to Volume 6 is in preparation.

Lectures. Lectures were given at the Institute during the Michaelmas and Lent Terms.

1955	
14 October	"Transpolar flying", by Wing Commander M. D. Lyne, A.F.C.
29 October	"South", the film of Shackleton's British Imperial Trans-Antarctic Expedition of 1914-16 in the <i>Endurance</i> , and "The voyage of H.M.C.S. <i>Labrador</i> through the North West Passage, 1954".
19 November	"Cambridge Physiological Expeditions to Spitsbergen, 1953 and 1955", by Dr Mary Lobban.
1956	
28 January	"The north coast of Ellesmere Island", by G. Hattersley-Smith, D.Phil. (Oxon).
18 February	"The Secret Land", the film of the U.S. Navy's Antarctic Expedition "Operation Highjump", 1946-47.
10 March	"North East Land, 1955", by J. Hollin.
21 April	"The Soviet drifting station SP-3, 1954-55", by A. F. Treshnikov.

Friends of the Polar Institute. The membership is still approximately 300, representing a total subscription of about £500 a year. The Committee greatly appreciate the generosity, enthusiasm, and support of the Friends.

Gino Watkins Memorial Fund. The Committee for the Gino Watkins Fund report that the Gino Watkins award for 1956 had not been announced by the end of the year under report. The stock of equipment held by the Fund continues to increase and a most acceptable gift of equipment (tents and sleeping bags) was made by Nottingham University. Loans of equipment for use during the summer of 1956 were made this year to eight expeditions.

Visits. Mr A. F. Treshnikov and Professor I. V. Maksimov of the Arctic Institute (Arkticheskiy Nauchno-Issledovatel'skiy Institut), Leningrad, visited Cambridge as the guests of the Institute between 18 and 28 April. They were taken to see a number of other scientific institutions in the London and Liverpool areas. In return Dr B. B. Roberts and Dr T. E. Armstrong made a visit to the U.S.S.R. between 28 May and

9 June at the invitation of the Arctic Institute. In Leningrad and Moscow they visited a number of Institutions engaged in work on arctic problems. They also visited Havsforskninginstitutet at Helsingfors to discuss Baltic sea ice problems, and examined the icebreakers building at Wärtsilä-Koncernen, the only yard in the world which specializes in icebreakers.

Dr C. W. M. Swithinbank went to Canada from 3 November to 20 December 1955 and left again for Canada and the United States on 13 July 1956 in order to continue his sea ice studies. As representative of the British Glaciological Society, he attended a conference held partly in Grindelwald and partly on the Jungfrauoch from 3 to 7 April 1956, at which an international glaciological expedition to Greenland (1957-60) was formally constituted. His sea ice studies necessitated his working in Copenhagen between 14 May and 30 May 1956. While in Scandinavia he attended the Arctic Conference of the International Geophysical Year at Stockholm from 22 to 26 May.

Mr P. A. B. Gethin visited Sweden and worked in Göteborgs Stadsbibliotek from 27 to 31 December 1955.

Museum. Considerable progress has been made in cleaning and mounting the collection of water-colours. A special exhibition of water-colours by Staff Surgeon E. L. Moss, R.N., painted during the British Arctic Expedition of 1875-76, was held for four months from June 1956.

The Institute is particularly indebted to Mr W. H. Honey who has made and presented to the museum an accurate and most beautiful scale model of the *Fram*.

Library. During the year, 1879 publications were added to the library. Of these 441 were gifts, 212 were purchased and 1226 were received in exchange for the *Polar Record*. These totals include some 450 periodical and serial publications. Of maps and charts, 619 have been received of which 144 were gifts, 4 were purchased and 471 were received in exchange. Important additions to the manuscript collection are the papers of the Scottish Spitsbergen Syndicate, 1901-51, consisting of reports and general correspondence relating to company affairs, and details of its activities claims, property, and title deeds in Spitsbergen. Other notable acquisitions are the original journals of F. G. Jackson, kept during the Jackson-Harmsworth expedition to Zemlya Frantsa-Iosifa, 1894-97, in one of which is described Jackson's meeting with Nansen after the latter's sledge journey over the sea ice from the *Fram*.

The Institute wishes to express thanks to Miss C. K. Golding of Exeter, who has most generously continued her voluntary work of indexing during the year.

Gifts. The Institute is most grateful for all the valuable publications sent to the library in exchange for the *Polar Record* and regrets the impossibility of acknowledging them here severally.

We wish to thank the many people and organizations who have so kindly presented the following items:

Books and reprints

Professor H. Wison	Mrs L. Brooks	Miss M. Findlay
Ahlmann	A. W. A. Brown	R. L. Fisher
Dr T. E. Armstrong	H. A. Brown	E. Föyn
Dr A. M. Bailey	K. Bullough	Dr E. Geodecke
D. M. Baird	A. J. Carsola	Dr J. Georgi
J. B. Baird	R. Clarke	P. A. B. Gethin
P. D. Baird	J. Corbel	Dr J. W. Glen
Ted Bank II	J. F. Da Costa	J. M. Halpern
Dr A. Bauer	J. M. Cullen	W. C. Hansen
Dr B. M. Bensin	C. Desgoffe	Professor F. K. Hare
Dr G. C. L. Bertram	Dr R. S. Dietz	W. B. Harland
W. Bonner	J. P. Doncaster	F. Harper
Miss C. M. Botley	Admiral G. Dufek, U.S.N.	Dr J. M. Harrison
R. W. Boyle	Professor M. J. Dunbar	G. Hattersley-Smith
Miss C. Bradley	R. W. Feyling-Hanssen	J. Heller

W. H. Honey	M. M. Miller	Dr V. B. Scheffer
E. R. Hope	Dr E. Mohr	Dr V. Schytt
H. M. D. Hoyte	Dr S. Motoda	P. M. Scott
M. Hyde	Professor T. Nagata	G. Seligman
F. Illingworth	R. L. Nichols	Professor R. P. Sharp
Sir H. C. Jackson	Dr F. Nusser	P. A. Shumskiy
C. Jouanin	Professor N. E. Odell	G. C. Simpson
Dr L. F. Keating	Dr S. Orvig	W. Ślabczyński
Dr H. P. Kosack	P. Paulian	Dr W. J. L. Sladen
D. M. Kraus	R. N. Pehrson	F. F. Snyder
Dr M. Kumai	C. J. Pennycook	Dr W. C. Steere
Professor K. Kusunoki	F. A. Pitelka	Professor D. Stewart
G. Laclavère	Professor N. Polunin	G. M. Sutton
B. C. Landseer-Jones	P. W. Pomeroy	Dr C. W. M. Swithinbank
G. H. Liljequist	A. E. Porsild	R. J. F. Taylor
Dr E. J. Lindgren	Dr L. G. C. E. Pugh	P. Tchernia
Professor L. Liboutry	W. L. Putnam	A. F. Treshnikov
Professor Trevor Lloyd	R. W. Rand	C. R. Twinn
R. Lowe	Dr L. E. Richdale	P. E. Victor
Dr N. H. Mackworth	S. Richter	C. A. Wahrhaftig
J. N. Malaurie	Dr J. Rivolier	I. R. Whitaker
R. Marsden	Dr B. B. Roberts	K. Williamson
Dr D. C. Martin	G. de Q. Robin	Dr S. Zavatti
H. W. Menard	Dr J. Rousseau	Professor N. N. Zubov
Professor P. L. Mercanton	G. W. Rowley	
Kaptajn E. Mikkelsen	Dr K. S. Sandford	

Admiralty, Hydrographic Department
 Alaska, Territorial Department of Mines
 Aluminium Development Association, London
 Arctic Institute of North America (Montreal)
 Arkstisk Institut, Copenhagen
 Australia. Department of External Affairs. Antarctic Division
 British Columbia. Department of Mines and Forests
 British Columbia. Provincial Museum
 British North Greenland Expedition, 1952-54
 California Institute of Technology
 Cambridge Philosophical Society
 Cambridge University Explorers and Travellers Club
 Canada. Defence Research Board
 Canada. Department of Agriculture
 Canada. Department of Northern Affairs and National Resources
 Canada. Department of Transport
 Canada. Post Office Department
 Canadian Board on Geographical Names
 Canadian Government Travel Bureau
 Carnegie Institution of Washington
 Catholic University of America. Arctic Institute
 Challenger Society, London
 Comité Spéciale. Année Géophysique Internationale, Uccle
 Commonwealth Shipping Committee, London
Daily Telegraph and Morning Post
 Det Magnetiske Byrå, Bergen
Discovery
 Dominion Bureau of Statistics, Ottawa
 Durham University Exploration Society

Engineering Institute of Canada
 Executors of the late F. G. Jackson
 Expéditions Polaires Françaises
 Falkland Islands. Colonial Secretary's Office
 Falkland Islands and Dependencies Meteorological Service
 Falkland Islands Dependencies Survey
 Fire Research Organization, London
 Generalstabens Litografiska Anstalt, Stockholm
 Geological Society of America
 Harvard University, Department of Epidemiology
 Her Majesty's Stationery Office, London
 Hokkaido University, Faculty of Fisheries
 Hudson Bay Route Association
 Hunting Geophysics, Limited, London
 Imperial Chemical Industries Limited
 Institute for the Study of the History and Culture of the U.S.S.R., Munich
 International Geographical Union
 International Hydrographic Bureau
 International Whaling Commission
 Kroebe Anthropological Society, Berkeley, California
Life Magazine
 Little, Brown and Co., Boston, Mass.
 McGill University, Graduates' Society
 Maggs Bros. Limited, London
 Manitoba. Department of Mines and Natural Resources. Game Branch
 Marine Historical Association, Mystic, Connecticut
 Michigan State University Museum
 Ministry of Supply, London
 National Institute of Oceanography
 New Zealand Antarctic Society

Model of *Fram*

Set of French Antarctic postage stamps, 1956

Three engravings of portraits of Ferdinand Magellan and Sir John Franklin. Colour print: "An arctic funeral", 1886

Four water-colours by Staff Surgeon E. L. Moss, British Arctic Expedition, 1875-76

Inscribed pottery bowl

Ice chisel and ice axe

Hand organ taken by Admiral Sir Edward Parry on his arctic expeditions, 1819-20, 1820-23, and 1824-25

Print: "The north, or sledge for burdens in Kamchatka", 1789. Norwegian pulka (1-man sledge). Snow goggles

String vest

Water-colour of Polar Bear, by F. T. Laws, 1900

Snow goggles used during Norwegian-British-Swedish Antarctic Expedition, 1949-52

Terrestrial globe

W. H. Honey

B. Imbert

Mrs D. Irving-Bell

Colonel E. L. Moss, C.M.G.

Nippon Polar Research Institute
Oxford University Expedition to
Nordaustlandet, 1955Admiral Sir Edward Parry
K.C.B.

Dr B. B. Roberts

Robert Shaw and Co. Limited

R. J. Shingfield

Dr C. W. M. Swithinbank

The Reverend and Mrs A. H.
WrightJ. A. STEERS, *Chairman*

GEORGE BINNEY

B. C. BROWNE

IAN COX

W. B. HARLAND

L. P. KIRWAN

N. A. MACKINTOSH

J. M. WORDIE

NOTICES

The *Polar Record* is published in January, May and September each year. Contributions, also books and papers for listing in the bibliography of "Recent Polar Literature", should be addressed to the Editor, Scott Polar Research Institute, Lensfield Road, Cambridge, England.

Every effort is made to enable authors of articles to receive proofs, which they are requested to return without delay. Proofs of notes are not normally submitted to authors, except when especially requested.

Twenty-five reprints of articles are supplied free to authors; additional copies, which are provided at cost price, should whenever possible be requested on submitting the contribution. Reprints of notes are not normally supplied.

Correspondence arising out of notes and articles is welcomed.

The Scott Polar Research Institute is a signatory of the Royal Society's "Declaration on fair dealing in regard to copying from scientific periodicals". Details of the Declaration may be obtained upon application from the offices of the Royal Society, Burlington House, London, W. 1.

The cover of the journal is from a photograph by H. G. Ponting, taken during the British Antarctic Expedition, 1910-13.

PUBLICATIONS FOR SALE AT THE SCOTT POLAR RESEARCH INSTITUTE

Scientific Reports of the Terra Nova expedition, 1910-13

Reports dealing with meteorology, terrestrial magnetism, gravity determination, aurora observations, physiography and miscellaneous data are still available. For a detailed list, and prices, see the inside back cover of the *Polar Record*, No. 44.

Back issues of the Polar Record

A few sets of the *Polar Record*, Volumes 1-5 (Nos. 1-40), including indexes, are available, price £60 at the discretion of the Committee of Management; also the following separate issues at seven shillings and sixpence each:

Nos. 1, 2, 3, 4, 17, 19, 31, 32, 39 onwards.

Nos. 33/34, 35/36, and 37/38. These are double numbers and are fifteen shillings each.

Indexes for Volume 1 (Nos. 1-8), Volume 2 (Nos. 9-16) and Volume 3 (Nos. 17-24) are five shillings each, the index for Volume 4 (Nos. 25-32) is ten shillings, the index for Volume 5 (Nos. 33/34-40) is free and the index to Volume 6 (Nos. 41-46) is ten shillings.

Reprints of "Recent Polar Literature", from Nos. 37/38 onwards, are two shillings and sixpence for two reprints for each issue.

Reprints of "Illustrated Ice Glossary", by Terence Armstrong and Brian Roberts, from Volume 8, No. 52, 1956, are five shillings.

An illustrated descriptive pamphlet entitled *The Scott Polar Research Institute* is two shillings and ninepence.

Prices are subject to alteration without notice.

"FRIENDS OF THE POLAR INSTITUTE"

This association was established in March 1946 with two objects in view: first to provide a means whereby those interested in the promotion of polar exploration and research might assist the Scott Polar Research Institute, and secondly to keep members in touch both with the Institute and with present polar activities. Members receive the Annual Report of the Committee of Management, which describes the work and progress of the Institute, and the Annual Report of the "Friends of the Polar Institute".

The minimum annual subscription is one guinea. British taxpayers who are able to subscribe by covenanted agreement for a period of seven years will be giving additional assistance to the Institute. "Friends" are asked to subscribe separately to the journal of the Institute, the *Polar Record*.

The "Friends" have been the means of giving very valuable help to various sides of the Institute's work. Subscriptions are used principally for making accessions to the Museum and Library, for providing furniture and equipment, and for special needs which cannot be met from other sources.

SUBSCRIPTIONS TO THE *POLAR RECORD*

The *Polar Record* may be obtained direct from the Scott Polar Research Institute, Lensfield Road, Cambridge, England, or through any bookseller. The subscription is twenty-two shillings and sixpence a year, or seven shillings and sixpence a single copy, post free.